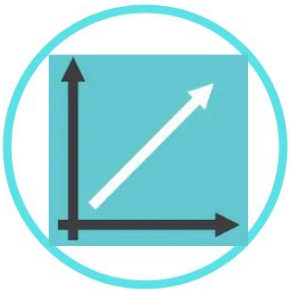
# MATH

## GRADE 7

Revision

# GRADE 7: SUMMARY & REVIEW QUESTIONS

## RATES & PROPORTIONAL REASONING



- Rates
- Complex Fractions and Unit Rates
- Convert Unit Rates
- Proportional and Non proportional Relationships
- Graph Proportional Relationships
- Solve Proportional Relationships
- Constant Rate of Change
- Slope
- Direct Variation

## PERCENTS

- Percent of a Number
- Percent and Estimation
- The Percent Proportion
- The Percent Equation
- Percent of Change
- Sales Tax, Tips and Markup
- Discount
- Simple Interest


## INTEGERS

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- Subtract Integers
- Multiply Integers
- Divide Integers

## RATIONAL NUMBERS

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- Compare and Order Rational Numbers
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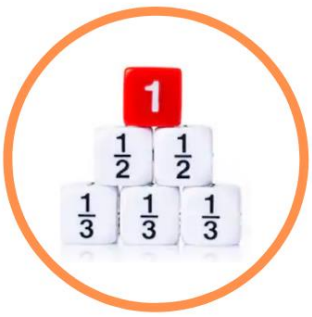
- Add and Subtract Unlike Fractions
- Add and Subtract Mixed Numbers
- Multiply Fractions
- Convert Between Systems
- Divide Fractions



# RATES SUMMARY

## UNIT RATE

To express a rate, as a unit rate, ensure the denominator of the unit fraction is 1.

$$\frac{90\ kg}{3\ people} = \frac{90\ kg \div 3}{3\ people \div 3} = \frac{30\ kg}{1\ person}$$

rate → unit rate

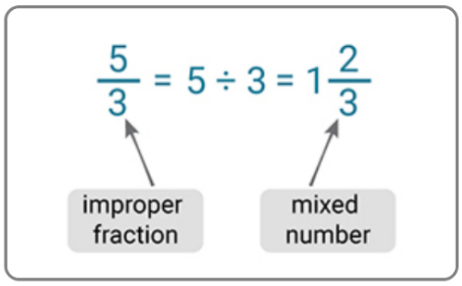
## COMPLEX FRACTION

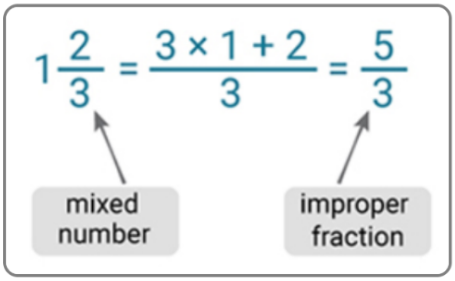
Complex fractions consist of fractions in the numerator, denominator or both.

$$\frac{\frac{3}{4}}{5} \qquad \frac{\frac{3}{5}}{\frac{1}{4}} \qquad \frac{12}{\frac{1}{10}}$$

## CONVERT FRACTIONS

When simplifying complex fractions, it is useful to remember how to convert from a mixed number to an improper fraction, and vice versa.




## RECIPROCAL

To find a fraction's reciprocal, flip the fraction - the denominator will be the numerator, and the numerator will be the denominator.

The reciprocal of one quarter, is four.

$\frac{1}{4}$ and $\frac{4}{1}$

$\frac{11}{15}$ and $\frac{15}{11}$

# RATES SUMMARY

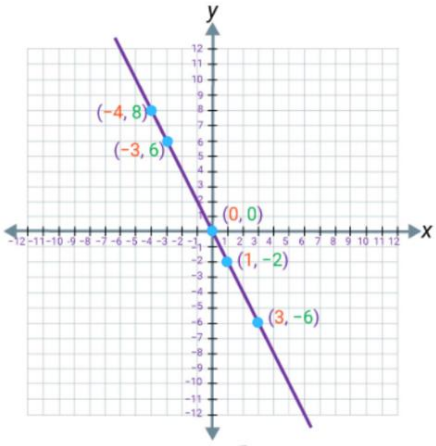
## PROPORTIONAL

Two quantities are proportional if the ratios are constant, or equivalent to each other.

$$\frac{3}{6} = \frac{1}{2}$$

To identify a proportional relationship on a graph,

- The points must lie on a straight line.
- The straight line must intersect at the origin (0, 0).




## NON PROPORTIONAL

Two quantities are not proportional if the ratios are not constant, or equivalent to each other.

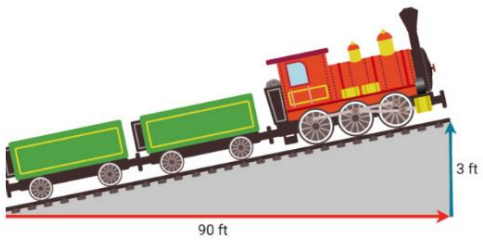
## SLOPE

The slope of a line is the ratio of the vertical change (rise), over the horizontal change (run)

$$slope = \frac{change\ in\ y}{change\ in\ x} = \frac{y_2 - y_1}{x_2 - x_1}$$

For example, the slope of the line can be calculated;

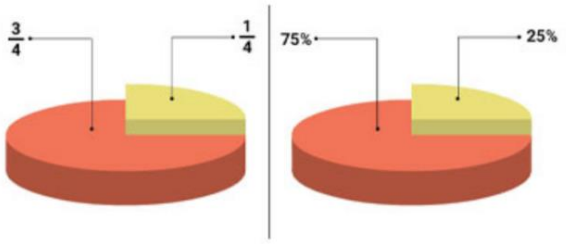
$$slope = \frac{rise}{run} = \frac{3}{90} = \frac{1}{30}$$



# PERCENTS SUMMARY

## PERCENT

A ratio of a number with 100 in the denominator. The percent can be expressed as a decimal and fraction.




## PERCENT PROPORTION

A percent proportion is two equivalent ratios, in which of the ratios has a denominator of 100.

$$\frac{Part}{Whole} = \frac{\%}{100}$$

## CROSS PRODUCT

The cross product is the product of the numerators and denominators of opposite fractions, in a proportion.

$$\frac{12}{150} = \frac{8}{100}$$

The cross product is used to simplify and evaluate a proportion.

## SALES, TAXES AND TIPS

- The original price is the price of an item before tax.
- A tax is a fee added to the price of goods and services, usually as a percent of the total price.
- A tip (or gratuity) is an additional amount of money given for a service.

# PERCENTS SUMMARY

## PERCENT CHANGE

A percent of change is the ratio that compares the change in quantity to the original amount in the ratio.

$$Percent\ of\ change = \frac{Amount\ of\ change}{Original\ value}$$

- A negative percent of change indicates a decrease from the original value to the second value.
- A positive percent of change indicates an increase from the original value to the second value.

## PERCENT EQUATION

The percent equation is directly related to the percent proportion, and is used to solve percent problems.

$$part = percent \times whole$$

12 is 50% of 24

part percent whole

## SIMPLE INTEREST

- Simple interest ($I$) is the amount of interest that will be earned.
- The principal ($p$), or the initial amount that is borrowed or invested
- The annual rate. The rate ($r$) is a percent, and we write it as a decimal when we put it in the formula
- Time ($t$). This is usually given as years when calculating interest annually.

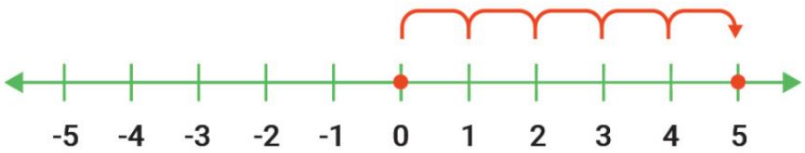
$$I = prt$$

# INTEGERS SUMMARY

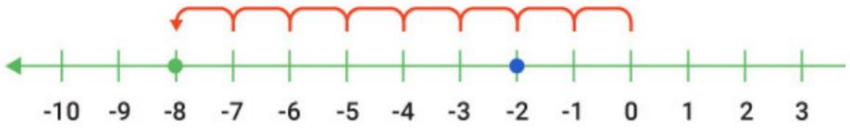
## ABSOLUTE VALUE

The absolute value of a number is its distance from zero. It is always positive.

- Bars are placed on either side to indicate the absolute value.



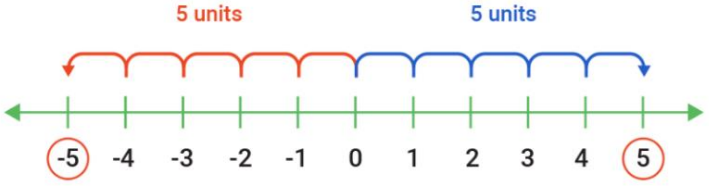

- The absolute value of 5, |5| is 5.
- The absolute value of -8, |-8| is 8.




## ADDITIVE INVERSE

The inverse of a number is the opposite of the number.

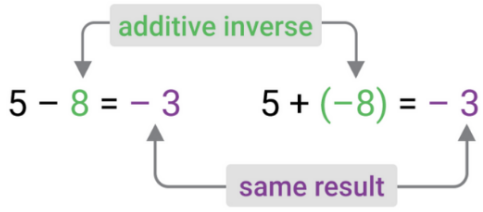
For example, 5 is the additive inverse of -5.

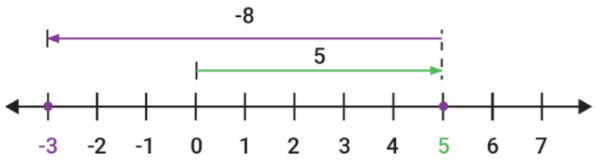


# INTEGERS SUMMARY

## SUBTRACTING INTEGERS

We can use the additive inverse to solve simple subtraction problems, by changing the subtraction problem into addition.




## MULTIPLYING PROPERTIES

**Multiplicative Property of Zero**

The product of a number and zero, is zero.
3 × 0 = 0
0 x -5 = 0

**Associative Property of Multiplication**

Numbers can be grouped in any way.
(2 × 3) × 4 = 2 × (3 × 4)

**Commutative Property of Multiplication**
Two numbers can be multiplied in either order to get the same answer.
3 × 4 = 4 x 3

## DIVIDING INTEGERS

Consider the sign of the divisor and dividend to determine the sign of the quotient.

4 ÷ 2 = 2 -4 ÷ -2 = 2 4 ÷ -2 = -2 -4 ÷ 2 = -2

# RATIONAL NUMBERS SUMMARY

## DECIMALS

- Repeating decimals involve a decimal that has one or more digits that continue to repeat.
- A bar is placed above the repeating digits.

8.333333... and
5.329329329329... → $5.\overline{329}$ *(with a bar above)*
are examples of repeating decimals

## FRACTIONS: ADD AND SUBTRACT

Like fractions are fractions that have the same denominator.

$\frac{3}{4}$ $\frac{2}{4}$

Unlike fractions are fractions that have a different denominator.

$\frac{2}{7}$ $\frac{2}{11}$

When adding and subtracting unlike fractions, rename the fractions to have the same denominator.

$$\frac{1}{2} + \frac{1}{3} + \frac{1}{5} \rightarrow \frac{15}{30} + \frac{10}{30} + \frac{6}{30}$$

## DIVIDING FRACTIONS

Remember to convert the mixed number to an improper fraction, before dividing.

Keep Change Flip

$\frac{a}{b}$ ÷ → × $\frac{x}{y}$ → $\frac{y}{x}$

# RATIONAL NUMBERS SUMMARY

## FRACTIONS AND PERCENTS

- To convert a percent to a decimal, move the decimal two places to the left, or divide by 100. For example, 25% = 0.25.

- To convert a fraction to a decimal, divide. For example, the fraction 4 over 25 is equal to 0.16.

25% 0.25

Move the decimal point two places to the left.

$$
\begin{array}{r}
0.16 \\
25\overline{)\,4.00} \\
-0 \\
\hline
40 \\
-25 \\
\hline
150 \\
-150 \\
\hline
0
\end{array}
$$

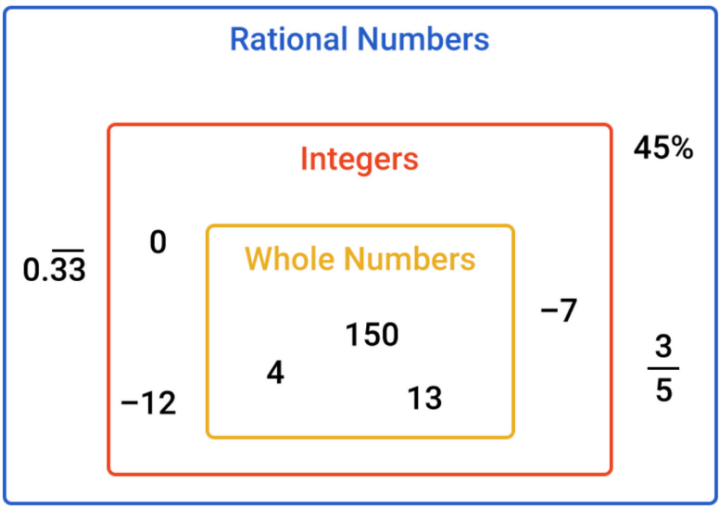
## RATIONAL AND IRRATIONAL

- A rational number is a number that can be expressed as the ratio of two integers.

- An irrational number is a number that cannot be written as a fraction.

- An integer is a whole number that can be written without a fractional component.

- When comparing numbers, convert them into the same form.



## Chapter 1: Ratios and Proportional Reasoning

**1. Find each unit rate. Round to the nearest hundredth if necessary.**

**a.** AED 12.49 for 4 packages

**b.** 2,560 gallons in 30 days

**c.** 44 students for 2 classes

**d.** 15.6°F in 14 minutes

**e.** 175 Calories in 12 ounces

**f.** 152.5 miles in 5.5 hours

**g.** 949 vehicles on 9 acres

**h.** AED 920 for 40 hours

**i.** 13 apples for 2 pies

**j.** 51 gallons in 14 minutes

2. A machinist can produce 114 parts in 6 minutes. At this rate, how many parts can the machinist produce in 15 minutes?

3. A recipe that makes 8 jumbo blueberry muffins calls for $1\frac{1}{2}$ teaspoons of baking powder. How much baking powder is needed to make 3 dozen jumbo muffins?

4. **Estimate the unit rate for each item. Justify your answers.**

**a.** AED 299 for 4 tires

**b.** 3 yards of fabric for AED 13.47

5. **Simplify.**

**a.** $\frac{2}{\frac{1}{3}}$

**b.** $\frac{\frac{1}{4}}{\frac{6}{8}}$

**c.** $\frac{6}{\frac{1}{5}}$

**d.** $\frac{\frac{8}{9}}{8}$

**e.** $\frac{\frac{4}{11}}{8}$

**f.** $\frac{\frac{4}{5}}{\frac{2}{15}}$

**g.** $\frac{\frac{9}{10}}{6}$

**h.** $\frac{20}{\frac{8}{15}}$

6. Saleh can jog $2\frac{3}{7}$ miles in $\frac{6}{11}$ hour. Find his average speed in miles per hour.

7. A truck driver drove 160 miles in $1\frac{1}{4}$ hours. What is the speed of the truck in miles per hour?

8. **Write each percent as a fraction in simplest form.**

**a.** $40\frac{1}{2}\%$

**b.** $30\frac{1}{4}\%$

b. $75\frac{1}{3}\%$

9. Complete. Round to the nearest tenth if necessary.

**a.** 660 ft/min = _____ ft/s

**b.** 64 mi/h ≈ _____ft/s

**c.** 32 gal/min = _____ qt/h

**d.** 815 gal/h ≈ _____qt/sec

**e.** 0.5 L/s = _____ mL/h

**f.** 6,000 lb/day = _____T/wk

**g.** 3.4 mi/h = _____ft/sec

**h.** 2 lb/wk ≈ _____oz/day

**i.** 5.6 lb/gal = _____ oz/gal

10. Khalid jogs at a rate of 7.5 miles per hour. How many miles per minute does Khalid jog?

11. Alonzo fills buckets at a rate of 6 gallons per minute. What is the rate in pints per hour?

12. Use the table of values. Write the ratios in the table to show the relationship between each set of values.

**a.**

| **Number of Hours** | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| **Total Amount Earned (AED)** | 15 | 30 | 45 | 60 |
| **Ratios** | | | | |

**b.**

| **Number of Packages** | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| **Total Cost (AED)** | 11 | 20 | 29 | 38 |
| **Ratios** | | | | |

13. Use the table of values. Write *proportional* or *non-proportional.*

**a.**

| **Number of Hours** | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| **Total Amount Earned (AED)** | 0.99 | 1.98 | 2.97 | 3.96 |

**b.**

| **Number of Hours** | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| **Total Amount Earned (AED)** | 17.25 | 35.50 | 50.75 | 70 |

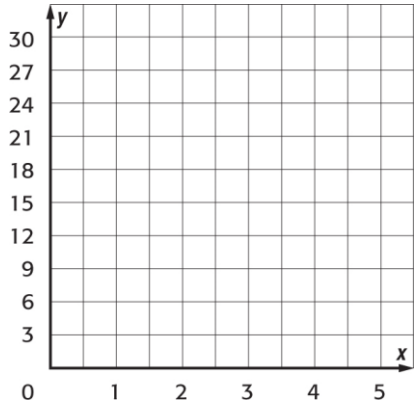
**c.**

| **Number of Hours** | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| **Number of Pages Read in Book** | 37 | 73 | 109 | 145 |

14. Determine whether the relationship between the two quantities shown in each table are proportional by graphing on the coordinate plane.

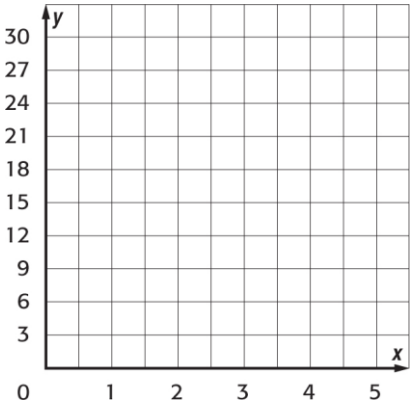
**a.**

| Gallons of Gas Used Per Hour | |
|---|---|
| **Number of Hours** | **Gallons of Gas** |
| 3 | 15 |
| 4 | 20 |
| 5 | 25 |




**b.**

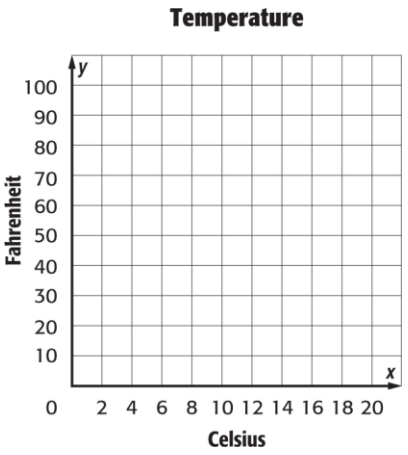
| Volume of a Cube | |
|---|---|
| **Side Length (ft)** | **Volume ($ft^3$)** |
| 1 | 1 |
| 2 | 8 |
| 3 | 27 |



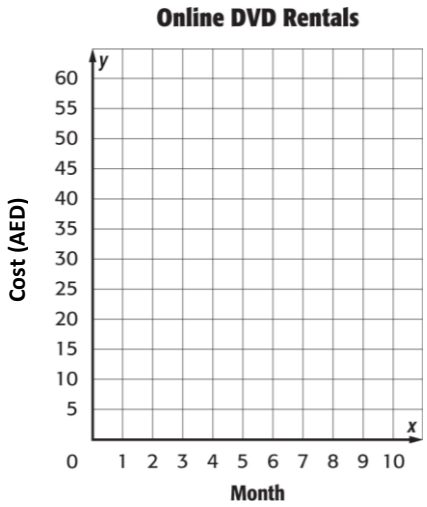

15. Determine whether the relationship between the two quantities shown in each table are proportional by graphing on the coordinate plane. Explain your reasoning.

**A.**

| Temperature (Degrees) | |
|---|---|
| **Celsius** | **Fahrenheit** |
| 0 | 32 |
| 5 | 41 |
| 10 | 50 |
| 15 | 59 |
| 20 | 68 |

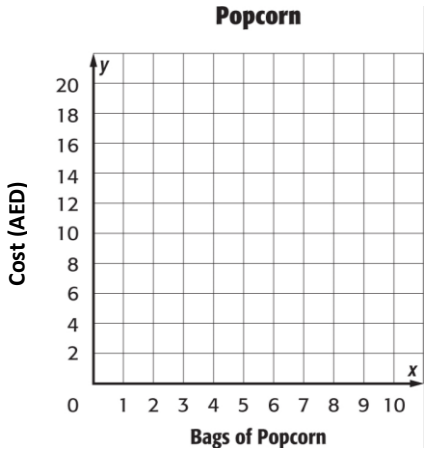


**B.** An online DVD rental company charges AED 15 a month for unlimited rentals. Determine whether the total paid after each month is proportional to number of months by graphing on the coordinate plane. Explain your reasoning.




**C.**

| Popcorn | |
|---|---|
| **Bags of Popcorn** | **Cost (AED)** |
| 0 | 0 |
| 1 | 4 |
| 2 | 8 |
| 3 | 12 |
| 4 | 16 |




16. Solve each proportion.

**a.** $\frac{11}{10} = \frac{n}{14}$

**b.** $\frac{18}{x} = \frac{6}{10}$

**c.** $\frac{b}{5} = \frac{8}{16}$

**d.** $\frac{t}{6} = \frac{30}{36}$

**f.** $\frac{0.45}{4.2} = \frac{p}{14}$

**g.** $\frac{2.5}{35} = \frac{2}{d}$

**h.** $\frac{3.5}{18} = \frac{z}{36}$

**i.** $\frac{2.4}{6} = \frac{2.8}{s}$

17. Assume all situations are proportional.

a. An assembly line worker at Rob's Bicycle factory adds a seat to a bicycle at a rate of 2 seats in 11 minutes. Write a proportion relating the number of seats *s* to the number of minutes *m*. At this rate, how long will it take to add 16 seats? 19 seats

b. For every girl taking classes at the martial arts school, there are 3 boys who are taking classes at the school. If there are 236 students taking classes, write and solve a proportion to predict the number of boys taking classes at the school.

18. Find the constant rate of change for each table.

**A.**

| Number of Trees | Number of Apples |
|---|---|
| 5 | 100 |
| 10 | 200 |
| 15 | 300 |
| 20 | 400 |

**B.**

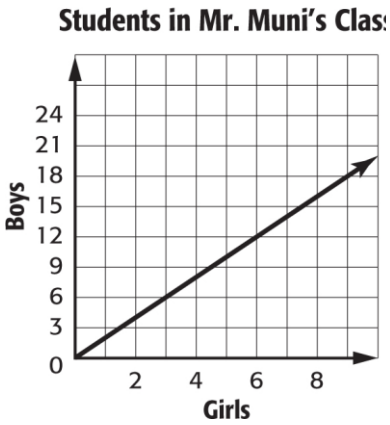
| Number of Students | Number of Magazines Sold |
|---|---|
| 10 | 100 |
| 15 | 150 |
| 20 | 200 |
| 25 | 250 |

**C.**

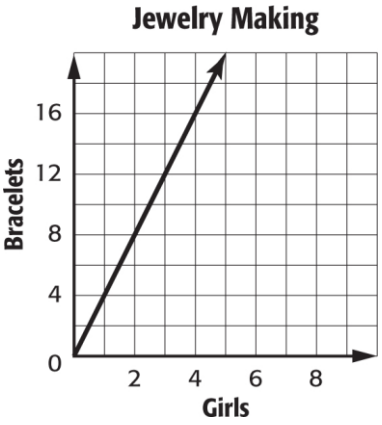
| Time | Temperature (°F) |
|---|---|
| 9:00 | 60 |
| 10:00 | 62 |
| 11:00 | 64 |
| 12:00 | 66 |

19. **Find the constant rate of change for each graph.**

**A.**



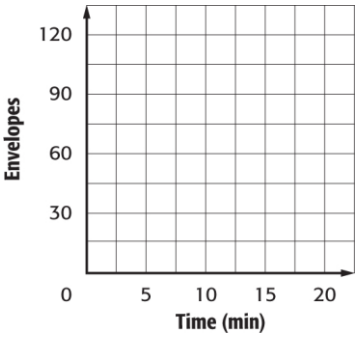
**B.**



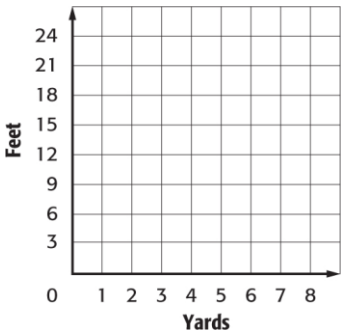

20. Graph the data. Then find the slope. Explain what the slope represents.

a. The table shows the number of envelopes stuffed for various times.

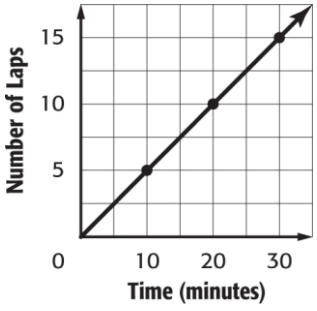
| **Time (min)** | 5 | 10 | 15 | 20 |
|---|---|---|---|---|
| **Envelopes Stuffed** | 30 | 60 | 90 | 120 |



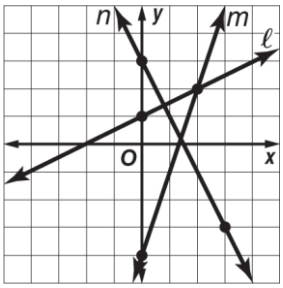

b. There are 3 feet for every yard.




c. Use the graph that shows the number of laps completed over time. Find the slope of the line.



d. Which line is the steepest? Explain using the slopes of lines $\ell$, $m$, and $n$.




21. Determine whether each linear function is a direct variation. If so, state the constant of proportionality.

**A.**

| **Speed, *x*** | 25 | 30 | 35 | 40 |
|---|---|---|---|---|
| **Distance, *y*** | 100 | 120 | 140 | 160 |

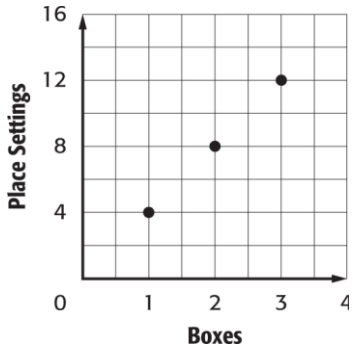
**B.**

| **Price, *x*** | AED 5 | AED 8 | AED 11 | AED 14 |
|---|---|---|---|---|
| **Tax, *y*** | AED 0.50 | AED 0.80 | AED 1.10 | AED 1.40 |

**C.**

| **Seconds, *x*** | 15 | 30 | 45 | 60 |
|---|---|---|---|---|
| **Number of Sit-ups, *y*** | 5 | 10 | 15 | 20 |

**D.** The number of place settings of dishes varies directly with the number of boxes. How many place settings are in each box?



## Chapter 2: Percents

1. Find each number. Round to the nearest hundredth if necessary.

**a.** 55% of 140

**b.** 40% of 123

**c.** 37% of AED 150

**d.** 25% of 96

**e.** 11% of AED 333

**f.** 99% of 14

**g.** 140% of 30

**h.** 165% of 10

**i.** 150% of 150

**j.** 225% of 16

**k.** 106% of AED 40

**l.** 126% of 35

**m.** 4.1% of 30

**n.** 45% of 156 is what number?

2. **Estimate by using fractions.**

**a.** 51% of 128

**b.** 76% of 200

**c.** 32.9% of 90

**d.** 23% of 8

**f.** 19% of 45

**g.** 81% of 1

3. Estimate by using 10%.

**a.** 12% of 98

**b.** 89% of 300

**c.** 31% of 80

**d.** 28% of 49

**e.** 62% of 13

**g.** 77% of 28

4. Estimate 0.5% of 87

5. The highest point in Arizona is Humphreys Peak, with an elevation of 12,633 feet. Estimate the elevation of the highest point in Florida, located in Walton County, if it is about 2.7% of the highest point in Arizona.

6. The brain mass of a newborn baby is about 13% of the body mass of the newborn. If a newborn has a body mass of 2,900 grams, about how much is the mass of the brain?

8. **Find each number. Round to the nearest tenth if necessary.**

**a.** What percent of 65 is 13?

**b.** AED 4 is what percent of AED 50?

**c.** What number is 35% of 22?

**d.** 14% of 81 is what number?

**e.** 13 is 26% of what number?

**f.** 55 is 40% of what number?

**g.** What percent of 45 is 72?

**h.** 1% of what number is 7?

**i.** 33 is 50% of what number?

**j.** What number is 3% of 100?

**k.** What percent of 200 is 0.5

**l.** What number is 0.4% of 20?

9. Fatima has AED 3 in her wallet. If this is 10% of her monthly allowance, what is her monthly allowance?

10. Of the 125 guests invited to a wedding, 104 attended the wedding. What percent of the invited guests attended the wedding?

11. Write an equation for each problem. Then solve. Round to the nearest tenth if necessary.

**a.** What number is 27% of 52?

**b.** Find 41% of 48.

**c.** What percent of 88 is 33?

**d.** 8 is what percent of 18?

**e.** What number is 33% of 360?

**f.** What percent of 62 is 58?

**g.** 55 is what percent of 100?

**h.** 22% of what number is 24.2?

**i.** 19 is 50% of what number?

**j.** 25 is 32% of what number?

12. A baseball player was at bat 473 times during the regular season. If he made a hit 31.5% of the times he was at bat, how many hits did he make during the regular season? Round to the nearest whole number if necessary.

13. Find each percent of change. Round to the nearest whole percent if necessary. State whether the percent of change is an *increase* or *decrease*.

**a.** 8 feet to 10 feet

**b.** 136 days to 85 days

**c.** AED 0.32 to AED 0.37

**d.** 62 trees to 31 trees

**e.** 51 meters to 68 meters

**f.** 16.5 grams to 24.8 grams

**g.** 0.55 minute to 0.1 minute

**h.** AED 180 to AED 210

**i.** 2.9 months to 4.9 months

**j.** 0.5 to 0.75

**k.** 0.1 to 0.2

14. Find each percent of change. Round to the nearest whole percent if necessary. State whether the percent of change is an *increase* or *decrease*.

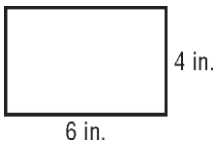
**a.** Recent developments in surgical procedures change the average healing time for some operations from 8 weeks to 3 weeks.

**b.** The city added an extra lane in each direction to the 5-lane road.

**c.** Refer to the rectangle shown. Suppose the width of 4 inches is decreased by 3 inches.

**a.** Find the percent of change in the perimeter.

**b.** Find the percent of change in the area.



15. **Find the total cost to the nearest cent.**

**a.** AED 18.00 breakfast; 7% tax

**b.** AED 14 meal; 20% tip

**c.** AED 24 lunch; 15% tip

**d.** AED 8.50 shorts; 6.5% markup

**e.** AED 75 dinner; 18% tip

**f.** AED 74.95 jacket; 5% tax

**g.** AED185 DVD player; 6% markup

**h.** AED 85 jeans; 7% tax

**i.** AED 20 haircut; 10% tip

16. Jassim took his family out for dinner. He planned to leave a 15% gratuity on the bill. What is the total cost if the bill was AED 123.50?

17. What is the sales tax on a AED 17,500 truck if the tax rate is 6%?

18. **Find the sale price to the nearest cent.**

**a.** AED 89.95 DVD player; 5% discount

**b.** AED 75 dress shirt; 20% discount

**c.** AED 14 socks; 15% discount

**d.** AED 2.99 toy; 30% discount

**e.** AED140 coat; 10% discount

**f.** AED 65 dress pants; 20% discount

**g.** AED 325 tent; 15% discount

**h.** AED 80 boots; 25% discount

**i.** AED 45.50 book; 30% discount

19. A radio is on sale for AED 50. If this price represents a 10% discount from the original price, what is the original price to the nearest nickel?

20. A box of laundry detergent is on sale for AED 6.50. If this price represents a 40% discount from the original price, what is the original price to the nearest cent?

21. Find the price of a AED 35 basketball that is on sale for 50% off the regular price.

22. Find the simple interest earned to the nearest cent for each principal, interest rate, and time.

**a.** AED 750, 7%, 3 years

**b.** AED 1,200, 3.5%, 2 years

**c.** AED 450, 5%, 4 months

**d.** AED 1,000, 2%, 9 months

**e.** AED 600, 8%, 1 month

23. Find the simple interest paid to the nearest cent for each loan, interest rate, and time.

**a.** AED 668, 5%, 2 years

**b.** AED 720, 4.25%, 3 months

**c.** AED 2,500, 6.9%, 6 months

**d.** AED 500, 12%, 18 months

**e.** AED 300, 9%, 3 years

**f.** AED 2,000, 20%, 1 year

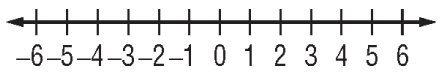
24. Rita charged AED 126 for a DVD player at an interest rate of 15.9%. How much will Rita have to pay after 2 months if she makes no payments?

25. The average cost for a vacation is AED 1,050. If a family borrows money for the vacation at an interest rate of 11.9% for 6 months, what is the total cost of the vacation including the interest on the loan?

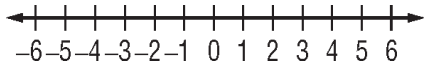
**Chapter 3: Integers**

1. Write an integer for each situation.
   a) a profit of AED 90
   b) 24 meters below sea level

2. Graph each set of integers on a number line.
   a) {–4, 0, 4}




   b) {–5, –1, 1, 6}




3. Evaluate each expression.
   a) | –8 |

   b) | –3 | + 5

   c) | 9 | – | –9 |

4. Write an integer to represent the elevation of Jebel Hafeet at 1,249 meters above sea level.

5. Gasoline prices occasionally fluctuate during a two-month period of time. Prices increased AED 2 per gallon during the month of April and decreased AED 1 per gallon during the month of May. Which situation has the greater absolute value? Explain.

6. **Add**.

   a) –13 + 42

   b) –21 + 30

   c) –24 + (–16)

   d) 7 + (–43)

   e) 12 + (–12) + 9

   f) –34 + (–10) + 25

7. Write an addition expression to describe each situation. Then find each sum and explain its meaning.

   a) Salama gained 2 kilograms. She then started a diet and lost 10 kilograms of her weight.

   b) At 4:00 A.M., the outside temperature was –8°C. By 4:00 P.M. that same day, it rose 4 degrees.

8. **Subtract.**

   a) 24 – 16

b) $-7 - 3$

c) $3 - (-4)$

d) $-1 - (-10)$

e) $-40 - 20$

f) $33 - 73$

9. Evaluate each expression if $x = -2$, $y = 3$, and $z = -9$.

a) $z - y$

b) $x - y$

c) $y - (-z)$

d) $x - y - z$

10. The highest and lowest recorded temperatures for a city in a year are 33°C and –2°C. Find the difference in these extreme temperatures.

11. The table lists the scores of 4 players in a game.

| **Player** | Salem | Ahmed | Sultan | Fahe |
|---|---|---|---|---|
| **Score** | –6 | –5 | +6 | +7 |

a) Find the difference between Sultan's score and Ahmed's score.

b) Find the difference between Fahed's score and Salem's score.

c) Find the difference between Ahmed's score and Salem's score.

12. Multiply.

a) 5(–6)

b) –12(7)

c) 6(–15)

d) –7(–3)

e) (–13)(–13)

f) $-15(0)$

g) $(-2)^3$

h) $(-3)(2)(-3)$

i) $-2(-5)^3$

13. **Simplify.**

a) $-2(3) - (-5)$

b) $(4)^2 - 2(-3)(-2)$

14. Find the product of –30 and –15.

15. Hiking up a mountain, you notice that the air temperature drops 5°C for every 500 meters increase in elevation. Write a multiplication expression to represent the decrease in temperature if you hike up the mountain 1,000 meters. Then evaluate the expression and explain its meaning.

16. **Divide.**

a) $64 \div (-8)$

b) $54 \div (-5)$

c) $-27 \div 3$

d) $-24 \div (-8)$

e) $-52 \div (-13)$

f) $\frac{-18}{-3}$

17. Find the quotient of –45 and –15.

18. Evaluate each expression if $f = -24$, $g = 3$, and $h = -4$.

a) $f \div h$

b) $f \div gh$

c) $\frac{h+f}{g+1}$

1. Write each fraction or mixed number as a decimal. Use bar notation if the decimal is a repeating decimal.

   a) $\frac{3}{8}$

   b) $\frac{1}{9}$

   c) $-\frac{13}{20}$

   d) $-\frac{2}{7}$

   e) $\frac{63}{12}$

   f) $\frac{9}{32}$

2. Write each decimal as a fraction or mixed number in simplest form.

   a) $0.24$

   b) $-0.13$

   c) $-2.75$

   d) $3.16$

3. Saif completed a marathon race in 3 hours and 12 minutes. Write Saif's running time as a decimal.

4. Compare. Use **>, <, or =**

   a) $\frac{1}{6}$ ○ $\frac{1}{3}$

   b) $\frac{5}{12}$ ○ $\frac{7}{18}$

   c) $-\frac{3}{10}$ ○ $-\frac{3}{12}$

   d) $-\frac{2}{5}$ ○ $-\frac{3}{12}$

   e) $2\frac{17}{20}$ ○ $2\frac{1}{5}$

   f) $-3\frac{1}{6}$ ○ $-3\frac{1}{9}$

5. Order from least to greatest.

   $\frac{3}{4}, \frac{2}{3}, 0.82$

6. To get to school, $\frac{35}{50}$ of the students ride in the family vehicle, 1 out of 12 students ride on the school bus, and 0.15 of the students ride a bike. Order the types of transportation students use to get to school from least to greatest.

7. Add or subtract. Write in simplest form.

   a) $\frac{2}{7} + \frac{5}{7}$

   b) $\frac{8}{11} - \frac{7}{11}$

   c) $-\frac{3}{10} - \frac{4}{10}$

d) $-\frac{2}{5}-\left(-\frac{1}{5}\right)$

e) $\frac{2}{13}+\frac{4}{13}+\frac{1}{13}$

f) $\left(\frac{3}{18}\right)+\frac{1}{18}-\frac{11}{18}$

8. Salma and Meera each planted tulips. Of Salma's 20 tulips, 18 were red, while 8 of Meera's 20 tulips were red. How much greater was Salma's fraction of red tulips than Meera's?

9. Add or subtract. Write in simplest form.

a) $\frac{1}{18}+\frac{5}{9}$

b) $\frac{11}{15}-\frac{2}{5}$

c) $\frac{7}{12}-\frac{5}{24}$

d) $-\frac{3}{10}-\frac{4}{25}$

e) $\frac{5}{11}-\left(-\frac{3}{44}\right)$

f) $-\frac{2}{7}-\frac{1}{2}$

g) $3+\frac{1}{6}$

h) $\frac{2}{3}+\frac{4}{15}+\frac{1}{9}$

i) $\frac{3}{4}+\frac{1}{6}-\frac{11}{12}$

10. If $\frac{2}{3}$ of the girls in class have brown eyes and $\frac{1}{12}$ of the girls have blue eyes, what fraction of the girls in class have neither blue or brown eyes?

11. Hamad made an apple pie. His brother ate $\frac{1}{9}$ of the pie and his sister ate $\frac{3}{5}$ of the pie. How much less did his brother eat than his sister?

12. Add or subtract. Write in simplest form.

a) $7\frac{3}{8}+1\frac{1}{8}$

b) $5\frac{5}{7} - 1\frac{1}{7}$

c) $4\frac{3}{4} + 3\frac{1}{2}$

d) $6\frac{7}{10} - 3\frac{1}{4}$

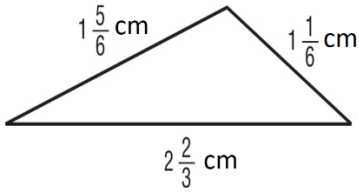
e) $9\frac{9}{20} + 1\frac{4}{5}$

f) $4\frac{5}{8} - 2\frac{7}{8}$

g) $7 - 2\frac{3}{10}$

h) $3\frac{1}{18} + 3\frac{5}{9} - 2\frac{1}{6}$

13. Find the perimeter of the triangle.




14. Multiply. Write in simplest form.

a) $\frac{4}{5} \times \frac{1}{2}$

b) $-\frac{5}{14} \times 7$

c) $-\frac{6}{13} \times \left(-\frac{1}{6}\right)$

d) $\frac{5}{7} \times \frac{2}{5}$

e) $-\frac{5}{8} \times \frac{24}{25}$

f) $3\frac{2}{9} \times \frac{3}{8}$

g) $\frac{2}{26} \times \left(-4\frac{1}{3}\right)$

h) $20 \times 2\frac{2}{5}$

i) $3\frac{1}{3} \times \left(-2\frac{2}{3}\right)$

j) $-2\frac{2}{7} \times 1\frac{1}{6}$

15. Find $\frac{1}{5}$ of $\frac{1}{10}$ of a meter.

16. Find $\frac{1}{3}$ of $\frac{1}{60}$ of an hour.

17. Evaluate each verbal expression.

a) one fourth of two eighths

b) three fifths of one half

18. A hiker averages $6\frac{1}{4}$ kilometers per hour. If he hikes for $3\frac{1}{3}$ hours, how many kilometers does he hike?

19. Complete. Round to the nearest hundredth if necessary.

a) 3.42 m ≈ yd

b) 1.4 mi ≈ km

c) 0.35 m ≈ ft

d) 4.5 qt ≈ mL

e) 600 mL ≈ pt

f) 4.24 L ≈ gal

g) 815.5 g ≈ lb

h) 8.5 in. ≈ cm

i) 94 cm ≈ in.

j) 250 mL ≈ c

k) 9 c ≈ mL

l) 320 lb ≈ kg

20. Determine which measurement is greater.

a) 4 yd, 2.7 m

b) 9 lb, 5 kg

21. Order the following measures from least to greatest: 1.5 m, 20 in., 1.15 ft, 250 cm

22. Hind measured the length of her room and found that it was 5 meters long. About how many yards is the length of her room?

23. Divide. Write in simplest form.

a) $\frac{3}{10} \div \frac{3}{5}$

b) $-\frac{2}{7} \div \frac{6}{35}$

c) $9 \div \frac{1}{5}$

d) $\frac{2}{11} \div 4$

e) $5\frac{1}{5} \div (-13)$

f) $2 \div 1\frac{1}{3}$

g) $\frac{3}{8} \div 2\frac{1}{6}$

h) $-\frac{2}{9} \div \left(-3\frac{1}{8}\right)$

i) $6\frac{1}{4} \div \frac{7}{16}$

j) $-8\frac{1}{9} \div \frac{4}{9}$

24. Use the table that shows the weights of three sizes of pizza.

| Pizza Size | Weight |
|---|---|
| Extra-large | $4\frac{1}{2}$ |
| Medium | $3\frac{1}{8}$ |
| Small | $1\frac{1}{4}$ |

a) How many times as heavy is the extra-large pizza than the small pizza?

b) How many times heavier is the medium pizza than the small pizza?

**Mock Test 1**
**Part 1: Multiple Choice**

Choose **one** correct answer.

1. Find the unit rate. Round to the nearest hundredth, if necessary.
   AED 8.43 for 3 kilograms

   a) AED 2.81/kg  b) AED 2.18/kg  c) AED 3.18/kg  d) AED 3.81/kg

2. Given $x = -2$, $y = 3$, and $z = -9$, evaluate the expression, $|x - z|$.

   a) 11  b) 7  c) -11  d) -7

3. Write an addition expression for the situation; Saif owes his mom AED 75. He borrows another AED 50 from her.

   a) -75 + (-50)  b) 175 + (-50)  c) -50 + (-50)  d) 75 + (-50)

4. Find the quotient of $-52 \div (-13)$.

   a) -3  b) 3  c) 4  d) -4

5. Write an integer for the situation "a gain of AED 69".

   a) -69  b) -31  c) 69  d) 0

6. Evaluate the following expression $| 9 | - | -9 |$.

   a) 0  b) 9  c) -9  d) 18

7. Estimate 303% of 500

   a) 1,500  b) 2,000  c) 500  d) -1,000

8.Evaluate the following; $\left(\frac{4}{9}-\frac{7}{9}\right)+\frac{1}{9}$.

a) $\frac{1}{9}$ b) $-\frac{1}{9}$ c) $-\frac{2}{9}$ d) $\frac{2}{9}$

9. Simplify the following complex fraction; $\frac{\frac{6}{7}}{\frac{9}{14}}$.

a) $\frac{1}{3}$ b) $\frac{5}{3}$ c) $\frac{4}{3}$ d) ) $\frac{7}{3}$

10. Find the sale price, given a tie costs AED 52, and there is a 50% discount.

a) AED 26 b) AED 5.2 c) AED 2.6 d) AED 52

11. What is 12% of 12.

a) 14.4 b) 1.44 c) 0.144 d) 144

12. Write the fraction $\frac{7}{9}$ as a decimal. Use bar notation if the decimal is a repeating decimal.

a) 0.7 b) 0.77 c) 7.7 d) $0.\overline{7}$

13. Find the constant rate of change for the given table.

| Time Spent Mowing (h) | Money Earned (AED) |
|---|---|
| 1 | 10 |
| 3 | 30 |
| 5 | 50 |
| 7 | 70 |

a) 5 b) 10 c) 15 d) 20

14. Find the simple interest earned to the nearest fils for each principal, interest rate, and time**;** AED 530, 6%, 1 year

a) AED 318 b) AED 31.80 c) AED 0.32 d) AED 3.18

**Part 2: Problem Solving**

Show your full working out when answering these questions.

15. Sheikha reads $7\frac{1}{2}$ pages of a book in 12 minutes. What is her average reading rate in pages per minute?

16. Determine whether the relationship between the two quantities shown in each table are proportional by graphing on the coordinate plane.

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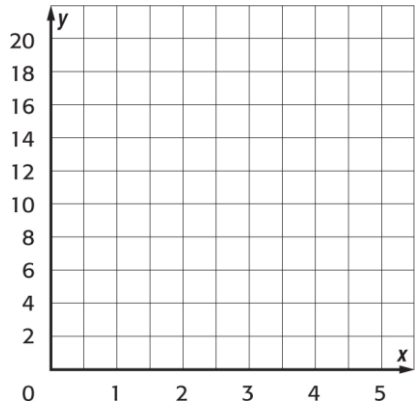
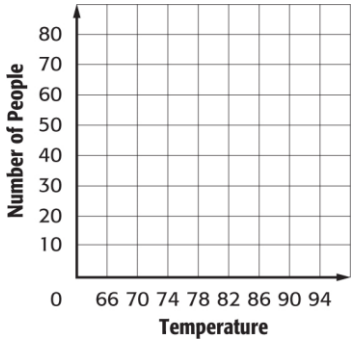
| DVD Rental | |
|---|---|
| **Number of DVDs** | **Cost (AED)** |
| 1 | 7 |
| 2 | 9 |
| 3 | 11 |




17. Fahd is painting a fence that is 26 feet long and 7 feet tall. A gallon of paint will cover 350 square feet. Assuming the situation is proportional, write and solve a proportion to determine how many gallons of paint Fahd will need.

18. Graph the data, and then find the slope. Explain what the slope represents.

| **Temperature (°F)** | 70 | 78 | 86 | 94 |
|---|---|---|---|---|
| **Number of People on Beach** | 24 | 40 | 56 | 72 |

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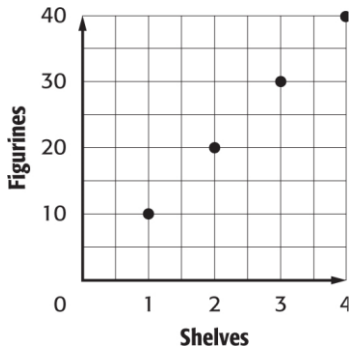
19. A meteorologist reported that in the month of April there were 3 cm more rainfall than normal. Write an integer to represent the amount of rainfall above normal in April.

20. The memory card on Saleh's digital camera can hold about 430 pictures. Saleh used 18% of the memory card while taking pictures at a family reunion. About how many pictures did Saleh take at the family reunion? Round to the nearest whole number

21. Majid is arranging figurines on shelves. The number of figurines varies directly with the number of shelves. Given the graph, what is the constant of proportionality?




22. Salem used 2.8 pounds of sugar in a recipe. About how many grams is the mass of the sugar?
Use 1 lb ≈ 453.6 g.

**Mock Test 2**

**Part 1: Multiple Choice**

Choose **one** correct answer.

1. Find the unit rate. Round to the nearest hundredth, if necessary.
   357 miles in 6.3 hours.

   a) 56.67 miles  b) 156.67 miles  c) 105.67 miles  d) 136.67 miles

2. Evaluate the following expression $|-14| \div 2 \times |-3|$.

   a) -21  b) 21  c) 42  d) -42

3. Simplify the following complex fraction; $\frac{\frac{3}{8}}{\frac{7}{12}}$.

   a) $\frac{21}{80}$  b) $\frac{1}{3}$  c) $\frac{3}{4}$  d) $\frac{9}{14}$

4. Evaluate the expression $-7(2)(5)$.

   a) -70  b) 100  c) 70  d) 70

5. Given the table, identify the ratio between each set of values.

| **Number of Classrooms** | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| **Total Students** | 24 | 48 | 72 | 92 |

a) $\frac{24}{3}$ b) $\frac{24}{4}$ c) $\frac{24}{1}$ d) $\frac{24}{2}$

6. Given the table, describe the relationship between the number of lunches bought, and the total cost of lunches.

| **Number of Lunches** | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| **Total Cost (AED)** | 2.75 | 5.50 | 8.25 | 11 |

a) complex b) proportional c) simple d) non proportional

7. Find the value of *k* given the proportion, $\frac{3.6}{k} = \frac{0.2}{0.5}$

a) 9 b) 900 c) 0.9 d) 90

8. Evaluate the expression $\frac{-84}{12}$

a) -7 b) 8 c) 6 d) 9

9. Write an integer for the situation “10°C below zero”

a) -10 b) 0 c) -20 d) 20

10. Evaluate the expression $(-3)^2$

a) 9 b) -9 c) 3 d) 27

11. The table shows the weight in kilograms of some cats in a Zoo. What is the mean weight of these cats?

| **Cat** | Cheetah | Cougar | Lion | Tiger |
|---|---|---|---|---|
| **Weight** | 65 | 100 | 250 | 350 |

a) 191.50 b) 191.75 c) 191 d) 191.25

12. What is 45% of 156?

a) 70.2 b) 65.7 c) 56.7 d) 56

13. Order the following values from greatest to least; $2\frac{7}{8}$, 2.98, 2.4, 2.5

a) $2\frac{7}{8}$, 2.98, 2.4, 2.5 b) 2.98, $2\frac{7}{8}$, 2.5, 2.4 c) $2\frac{7}{8}$, 2.98, 2.5, 2.4 d) $2\frac{7}{8}$, 2.5, 2.98, 2.4

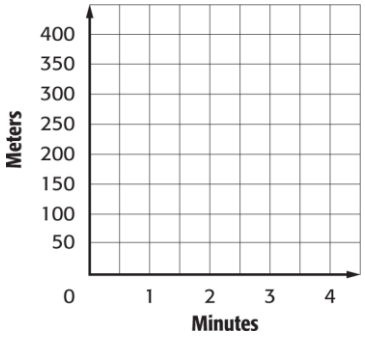
14. Evaluate the following; $4 - \frac{3}{4}$.

a) $3\frac{1}{8}$ b), $4\frac{1}{8}$ c) $3\frac{1}{4}$ d) $2\frac{3}{4}$

**Part 2: Problem Solving**

Show your full working out when answering these questions.

15. Latonya swims 50 meters every $\frac{1}{2}$ minute. Graph this situation. Find the slope, and explain what the slope represents.




16. You need 2 yards of fabric to cover 3 pillows, and 6 yards to cover 9 pillows. How much fabric do you need to cover 15 pillows?

17. The value of a share of stock in an electronics company increased by $\frac{2}{3}$% during one week.
If the value of a share of stock was AED 141 at the beginning of the week, estimate the increase in value of a share of stock at the end of the week ?

18. Mohamed is buying a computer that normally sells for AED 890. The sales tax rate is 6%. What is the total cost of the computer including sales tax?


19. The length of a yard is 2.43 kilometers. Use a mixed number to represent this length?

20. Nadia knitted two scarves for her teddy bears. One was $10\frac{3}{4}$ cm long. The other was $3\frac{1}{8}$ cm shorter than the first. How long was the second scarf?

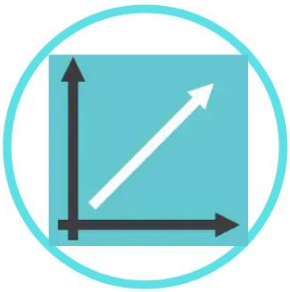
# MATH

## GRADE 7

Revision

# GRADE 7: SUMMARY & REVIEW QUESTIONS

## RATES & PROPORTIONAL REASONING



- Rates
- Complex Fractions and Unit Rates
- Convert Unit Rates
- Proportional and Non proportional Relationships
- Graph Proportional Relationships
- Solve Proportional Relationships
- Constant Rate of Change
- Slope
- Direct Variation

## PERCENTS

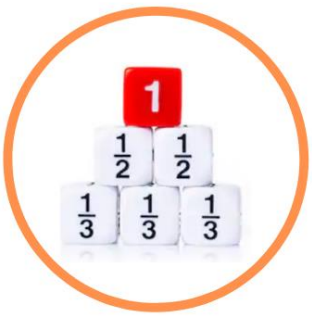
- Percent of a Number
- Percent and Estimation
- The Percent Proportion
- The Percent Equation
- Percent of Change
- Sales Tax, Tips and Markup
- Discount
- Simple Interest


## INTEGERS

- Integers and Absolute Values
- Add Integers
- Subtract Integers
- Multiply Integers
- Divide Integers

## RATIONAL NUMBERS

- Terminating and Repeating Decimals
- Compare and Order Rational Numbers
- Add and Subtract Like Fractions
- Add and Subtract Unlike Fractions
- Add and Subtract Mixed Numbers
- Multiply Fractions
- Convert Between Systems
- Divide Fractions



# RATES SUMMARY

## UNIT RATE

To express a rate, as a unit rate, ensure the denominator of the unit fraction is 1.

$$\frac{90\ kg}{3\ people} = \frac{90\ kg \div 3}{3\ people \div 3} = \frac{30\ kg}{1\ person}$$

rate → unit rate

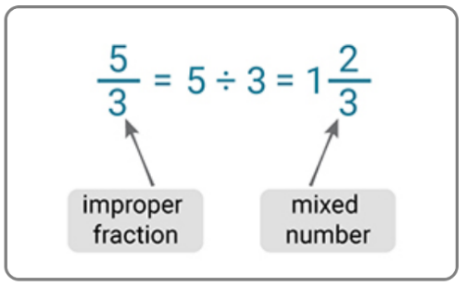
## COMPLEX FRACTION

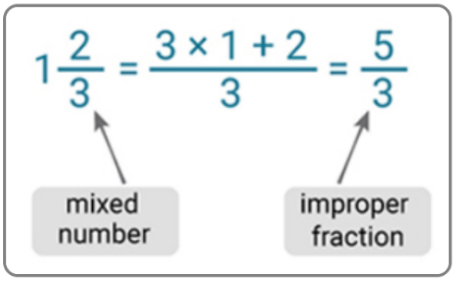
Complex fractions consist of fractions in the numerator, denominator or both.

$$\frac{\frac{3}{4}}{5} \qquad \frac{\frac{3}{5}}{\frac{1}{4}} \qquad \frac{12}{\frac{1}{10}}$$

## CONVERT FRACTIONS

When simplifying complex fractions, it is useful to remember how to convert from a mixed number to an improper fraction, and vice versa.




## RECIPROCAL

To find a fraction's reciprocal, flip the fraction - the denominator will be the numerator, and the numerator will be the denominator.

The reciprocal of one quarter, is four.

$\frac{1}{4}$ and $\frac{4}{1}$

$\frac{11}{15}$ and $\frac{15}{11}$

# RATES SUMMARY

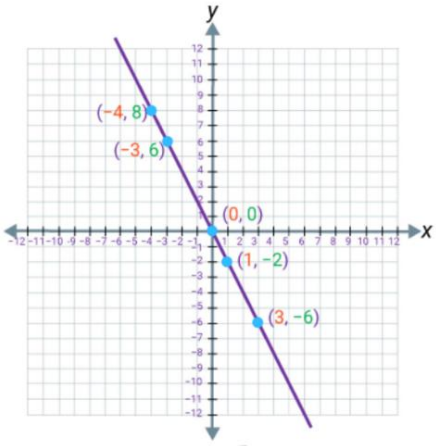
## PROPORTIONAL

Two quantities are proportional if the ratios are constant, or equivalent to each other.

$$\frac{3}{6} = \frac{1}{2}$$

To identify a proportional relationship on a graph,

- The points must lie on a straight line.
- The straight line must intersect at the origin (0, 0).




## NON PROPORTIONAL

Two quantities are not proportional if the ratios are not constant, or equivalent to each other.

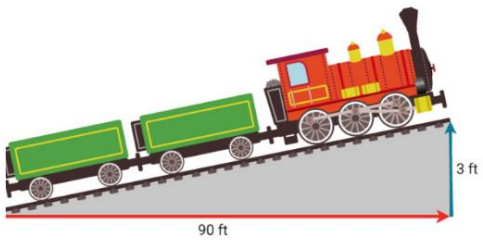
## SLOPE

The slope of a line is the ratio of the vertical change (rise), over the horizontal change (run)

$$slope = \frac{change\ in\ y}{change\ in\ x} = \frac{y_2 - y_1}{x_2 - x_1}$$

For example, the slope of the line can be calculated;

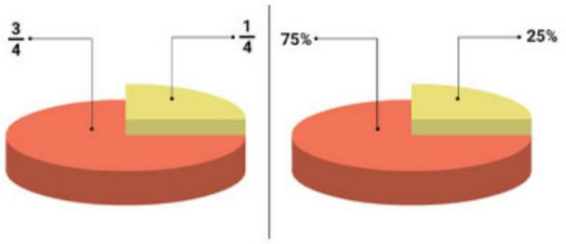
$$slope = \frac{rise}{run} = \frac{3}{90} = \frac{1}{30}$$



# PERCENTS SUMMARY

## PERCENT

A ratio of a number with 100 in the denominator. The percent can be expressed as a decimal and fraction.




## PERCENT PROPORTION

A percent proportion is two equivalent ratios, in which of the ratios has a denominator of 100.

$$\frac{Part}{Whole} = \frac{\%}{100}$$

## CROSS PRODUCT

The cross product is the product of the numerators and denominators of opposite fractions, in a proportion.

$$\frac{12}{150} = \frac{8}{100}$$

The cross product is used to simplify and evaluate a proportion.

## SALES, TAXES AND TIPS

- The original price is the price of an item before tax.
- A tax is a fee added to the price of goods and services, usually as a percent of the total price.
- A tip (or gratuity) is an additional amount of money given for a service.

# PERCENTS SUMMARY

## PERCENT CHANGE

A percent of change is the ratio that compares the change in quantity to the original amount in the ratio.

$$Percent\ of\ change = \frac{Amount\ of\ change}{Original\ value}$$

- A negative percent of change indicates a decrease from the original value to the second value.
- A positive percent of change indicates an increase from the original value to the second value.

## PERCENT EQUATION

The percent equation is directly related to the percent proportion, and is used to solve percent problems.

$$part = percent \times whole$$

12 is 50% of 24

part percent whole

## SIMPLE INTEREST

- Simple interest ($I$) is the amount of interest that will be earned.
- The principal ($p$), or the initial amount that is borrowed or invested
- The annual rate. The rate ($r$) is a percent, and we write it as a decimal when we put it in the formula
- Time ($t$). This is usually given as years when calculating interest annually.

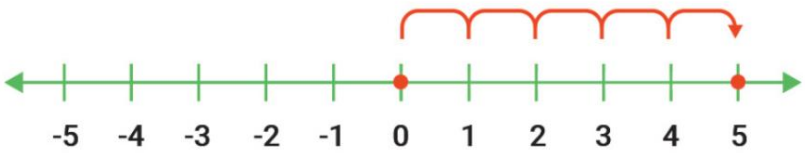
$$I = prt$$

# INTEGERS SUMMARY

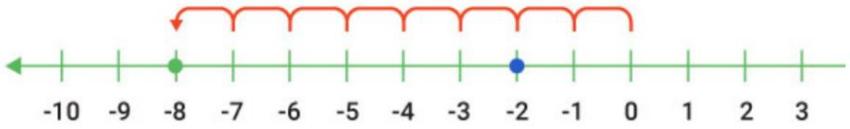
## ABSOLUTE VALUE

The absolute value of a number is its distance from zero. It is always positive.

- Bars are placed on either side to indicate the absolute value.



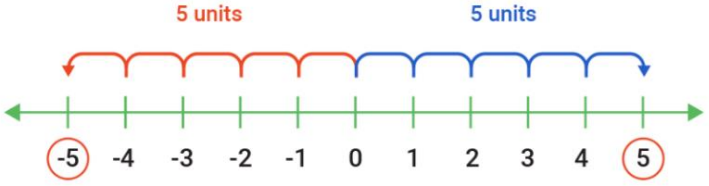

- The absolute value of 5, |5| is 5.
- The absolute value of -8, |-8| is 8.




## ADDITIVE INVERSE

The inverse of a number is the opposite of the number.

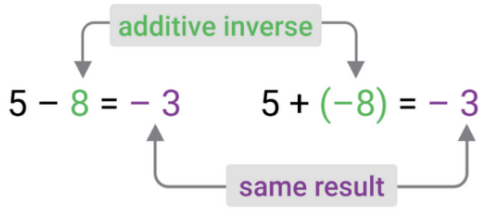
For example, 5 is the additive inverse of -5.

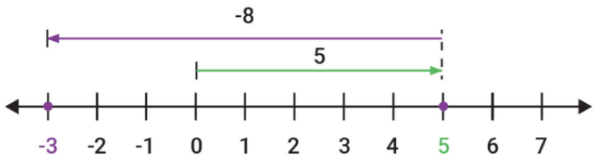


# INTEGERS SUMMARY

## SUBTRACTING INTEGERS

We can use the additive inverse to solve simple subtraction problems, by changing the subtraction problem into addition.




## MULTIPLYING PROPERTIES

**Multiplicative Property of Zero**

The product of a number and zero, is zero.
3 × 0 = 0
0 x -5 = 0

**Associative Property of Multiplication**

Numbers can be grouped in any way.
(2 × 3) × 4 = 2 × (3 × 4)

**Commutative Property of Multiplication**
Two numbers can be multiplied in either order to get the same answer.
3 × 4 = 4 x 3

## DIVIDING INTEGERS

Consider the sign of the divisor and dividend to determine the sign of the quotient.

4 ÷ 2 = 2 -4 ÷ -2 = 2 4 ÷ -2 = -2 -4 ÷ 2 = -2

# RATIONAL NUMBERS SUMMARY

## DECIMALS

- Repeating decimals involve a decimal that has one or more digits that continue to repeat.
- A bar is placed above the repeating digits.

8.333333... and
5.329329329329... → $5.\overline{329}$ *(with a bar above)*
are examples of repeating decimals

## FRACTIONS: ADD AND SUBTRACT

Like fractions are fractions that have the same denominator.

$\frac{3}{4}$ $\frac{2}{4}$

Unlike fractions are fractions that have a different denominator.

$\frac{2}{7}$ $\frac{2}{11}$

When adding and subtracting unlike fractions, rename the fractions to have the same denominator.

$$\frac{1}{2} + \frac{1}{3} + \frac{1}{5} \rightarrow \frac{15}{30} + \frac{10}{30} + \frac{6}{30}$$

## DIVIDING FRACTIONS

Remember to convert the mixed number to an improper fraction, before dividing.

Keep Change Flip

$\frac{a}{b}$ ÷ → × $\frac{x}{y}$ → $\frac{y}{x}$

# RATIONAL NUMBERS SUMMARY

## FRACTIONS AND PERCENTS

- To convert a percent to a decimal, move the decimal two places to the left, or divide by 100. For example, 25% = 0.25.

- To convert a fraction to a decimal, divide. For example, the fraction 4 over 25 is equal to 0.16.

25% 0.25

Move the decimal point two places to the left.

$$
\begin{array}{r}
0.16 \\
25\overline{)\,4.00} \\
-0 \\
\hline
40 \\
-25 \\
\hline
150 \\
-150 \\
\hline
0
\end{array}
$$

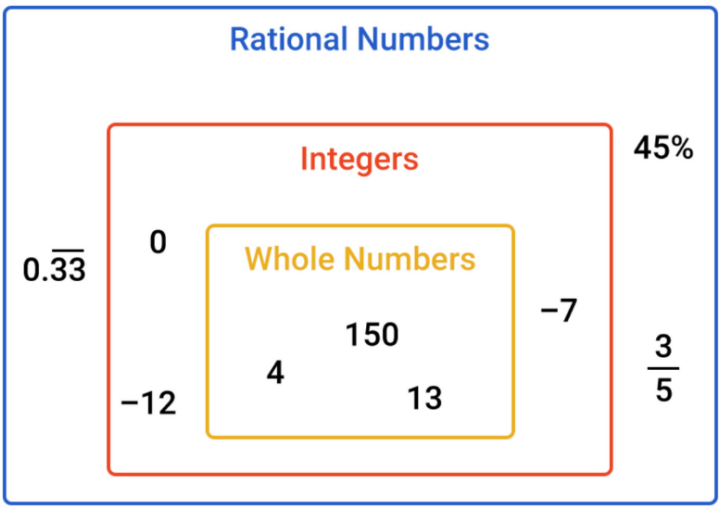
## RATIONAL AND IRRATIONAL

- A rational number is a number that can be expressed as the ratio of two integers.

- An irrational number is a number that cannot be written as a fraction.

- An integer is a whole number that can be written without a fractional component.

- When comparing numbers, convert them into the same form.



**Mock Test 1**
**Part 1: Multiple Choice**

Choose **one** correct answer.

1. Find the unit rate. Round to the nearest hundredth, if necessary.
   AED 8.43 for 3 kilograms

   a) AED 2.81/kg  b) AED 2.18/kg  c) AED 3.18/kg  d) AED 3.81/kg

2. Given $x = -2$, $y = 3$, and $z = -9$, evaluate the expression, $|x - z|$.

   a) 11  b) 7  c) -11  d) -7

3. Write an addition expression for the situation; Saif owes his mom AED 75. He borrows another AED 50 from her.

   a) -75 + (-50)  b) 175 + (-50)  c) -50 + (-50)  d) 75 + (-50)

4. Find the quotient of $-52 \div (-13)$.

   a) -3  b) 3  c) 4  d) -4

5. Write an integer for the situation "a gain of AED 69".

   a) -69  b) -31  c) 69  d) 0

6. Evaluate the following expression $| 9 | - | -9 |$.

   a) 0  b) 9  c) -9  d) 18

7. Estimate 303% of 500

   a) 1,500  b) 2,000  c) 500  d) -1,000

8.Evaluate the following; $\left(\frac{4}{9}-\frac{7}{9}\right)+\frac{1}{9}$.

a) $\frac{1}{9}$ b) $-\frac{1}{9}$ c) $-\frac{2}{9}$ d) $\frac{2}{9}$

9. Simplify the following complex fraction; $\frac{\frac{6}{7}}{\frac{9}{14}}$.

a) $\frac{1}{3}$ b) $\frac{5}{3}$ c) $\frac{4}{3}$ d) ) $\frac{7}{3}$

10. Find the sale price, given a tie costs AED 52, and there is a 50% discount.

a) AED 26 b) AED 5.2 c) AED 2.6 d) AED 52

11. What is 12% of 12.

a) 14.4 b) 1.44 c) 0.144 d) 144

12. Write the fraction $\frac{7}{9}$ as a decimal. Use bar notation if the decimal is a repeating decimal.

a) 0.7 b) 0.77 c) 7.7 d) $0.\overline{7}$

13. Find the constant rate of change for the given table.

| Time Spent Mowing (h) | Money Earned (AED) |
|---|---|
| 1 | 10 |
| 3 | 30 |
| 5 | 50 |
| 7 | 70 |

a) 5 b) 10 c) 15 d) 20

14. Find the simple interest earned to the nearest fils for each principal, interest rate, and time; AED 530, 6%, 1 year

a) AED 318 b) AED 31.80 c) AED 0.32 d) AED 3.18

**Part 2: Problem Solving**

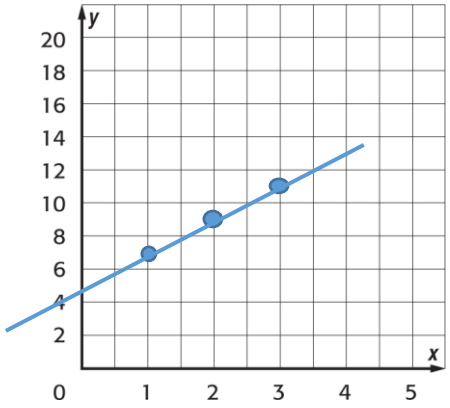
Show your full working out when answering these questions.

15. Sheikha reads $7\frac{1}{2}$ pages of a book in 12 minutes. What is her average reading rate in pages per minute?

$$\frac{7\frac{1}{2}}{12} = \frac{7.5 \div 12}{12 \div 12} = \frac{0.625}{1} = 0.625$$

16. Determine whether the relationship between the two quantities shown in each table are proportional by graphing on the coordinate plane.

| DVD Rental | |
|---|---|
| **Number of DVDs** | **Cost (AED)** |
| 1 | 7 |
| 2 | 9 |
| 3 | 11 |




**For the relationship between the two quantities to be proportional:**
**The points must line on a straight line (Yes)**
**The straight line must intersect at the origin (0,0) (No)**

17. Fahd is painting a fence that is 26 feet long and 7 feet tall. A gallon of paint will cover 350 square feet. Assuming the situation is proportional, write and solve a proportion to determine how many gallons of paint Fahd will need.

q

**First, find the area of the fence.**

**Area = 26 feet * 7 feet**
**Area = 182 square feet**

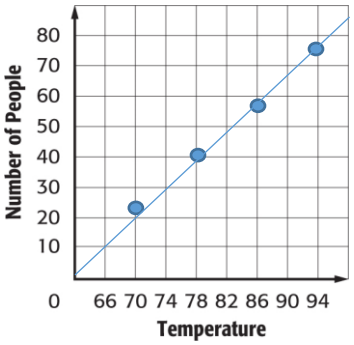
**Then set the proportion. where x is the number of gallons of paint for the fence.**

$$\frac{182}{350} = \frac{x}{1} \quad = \quad \frac{182}{350} = x = 0.52$$

**So little bit more than half a gallon.**

18. Graph the data, and then find the slope. Explain what the slope represents.

| **Temperature (°F)** | 70 | 78 | 86 | 94 |
|---|---|---|---|---|
| **Number of People on Beach** | 24 | 40 | 56 | 72 |




**The slope is the ratio of:**

**The vertical change (rise) over the horizontal change(run).**

**Slope** = $\frac{change\ in\ y}{change\ in\ x} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{40-24}{78-70} = \frac{16}{8} = 2$

.

19. A meteorologist reported that in the month of April there were 3 cm more rainfall than normal. Write an integer to represent the amount of rainfall above normal in April.

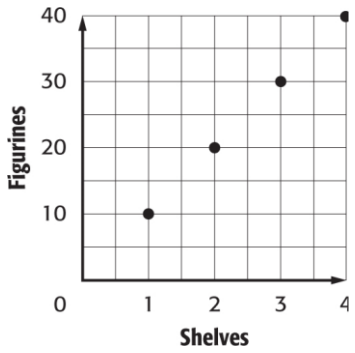
**The amount of rainfall above normal in April = +3 cm**

20. The memory card on Saleh's digital camera can hold about 430 pictures. Saleh used 18% of the memory card while taking pictures at a family reunion. About how many pictures did Saleh take at the family reunion? Round to the nearest whole number

**18% of 430 = $18\% \times 430 = 77.4$**

**Round to the nearest whole number = 77 pictures**

21. Majid is arranging figurines on shelves. The number of figurines varies directly with the number of shelves. Given the graph, what is the constant of proportionality?




**Constant of proportionality = k**

$$k = \frac{y}{x} = \frac{20}{2} = 10$$

22. Salem used 2.8 pounds of sugar in a recipe. About how many grams is the mass of the sugar?
Use 1 lb ≈ 453.6 g.

**1 lb → 453.6 g**
**2.8 lb → x g**

$$x = \frac{(2.8)(453.6)}{1} = x = 1270.08\ g$$

**Mock Test 2**

**Part 1: Multiple Choice**

Choose **one** correct answer.

1. Find the unit rate. Round to the nearest hundredth, if necessary.
   357 miles in 6.3 hours.

a) 56.67 miles  b) 156.67 miles  c) 105.67 miles  d) 136.67 miles

2. Evaluate the following expression $|-14| \div 2 \times |-3|$.

a) -21  b) 21  c) 42  d) -42

3. Simplify the following complex fraction; $\frac{\frac{3}{8}}{\frac{7}{12}}$.

a) $\frac{21}{80}$  b) $\frac{1}{3}$  c) $\frac{3}{4}$  d) $\frac{9}{14}$

4. Evaluate the expression $-7(2)(5)$.

a) -70  b) 100  c) 70  d) 70

5. Given the table, identify the ratio between each set of values.

| **Number of Classrooms** | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| **Total Students** | 24 | 48 | 72 | 92 |

a) $\frac{24}{3}$ b) $\frac{24}{4}$ c) $\frac{24}{1}$ d) $\frac{24}{2}$

6. Given the table, describe the relationship between the number of lunches bought, and the total cost of lunches.

| **Number of Lunches** | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| **Total Cost (AED)** | 2.75 | 5.50 | 8.25 | 11 |

a) complex b) proportional c) simple d) non proportional

7. Find the value of *k* given the proportion, $\frac{3.6}{k} = \frac{0.2}{0.5}$

a) 9 b) 900 c) 0.9 d) 90

8. Evaluate the expression $\frac{-84}{12}$

a) -7 b) 8 c) 6 d) 9

9. Write an integer for the situation “10°C below zero”

a) -10 b) 0 c) -20 d) 20

10. Evaluate the expression $(-3)^2$

a) 9 b) -9 c) 3 d) 27

11. The table shows the weight in kilograms of some cats in a Zoo. What is the mean weight of these cats?

| **Cat** | Cheetah | Cougar | Lion | Tiger |
|---|---|---|---|---|
| **Weight** | 65 | 100 | 250 | 350 |

a) 191.50 b) 191.75 c) 191 d) 191.25

12. What is 45% of 156?

a) 70.2 b) 65.7 c) 56.7 d) 56

13. Order the following values from greatest to least; $2\frac{7}{8}$, 2.98, 2.4, 2.5

a) $2\frac{7}{8}$, 2.98, 2.4, 2.5 b) 2.98, $2\frac{7}{8}$, 2.5, 2.4 c) $2\frac{7}{8}$, 2.98, 2.5, 2.4 d) $2\frac{7}{8}$, 2.5, 2.98, 2.4

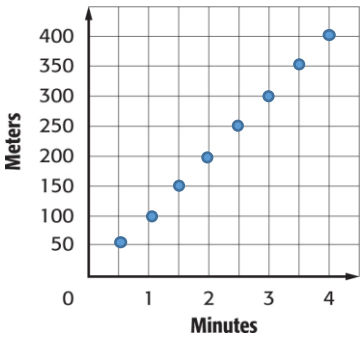
14. Evaluate the following; $4 - \frac{3}{4}$.

a) $3\frac{1}{8}$ b), $4\frac{1}{8}$ c) $3\frac{1}{4}$ d) $2\frac{3}{4}$

**Part 2: Problem Solving**

Show your full working out when answering these questions.

15. Latonya swims 50 meters every $\frac{1}{2}$ minute. Graph this situation. Find the slope, and explain what the slope represents.




**The slope is the ratio of:**

**The vertical change (rise) over the horizontal change(run).**

**Slope** $= \frac{change\ in\ y}{change\ in\ x} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{200 - 100}{2 - 1} = \frac{100}{1} = 100$

16. You need 2 yards of fabric to cover 3 pillows, and 6 yards to cover 9 pillows. How much fabric do you need to cover 15 pillows?

**2 → 3**
**6 → 9**
**x → 15**

**(6) (15) = 90 / 9 = 10 = x**

17. The value of a share of stock in an electronics company increased by $\frac{2}{3}$ % during one week.
If the value of a share of stock was AED 141 at the beginning of the week, estimate the increase in value of a share of stock at the end of the week ?

**I = (p)(r)(t) = (141)($\frac{2}{3}$ %)(1) = 0.94 AED**
**In other words:**
**1% of 141 = 0.01 · 141 = 1.41; 2 · 1.41 = 2.82; 2.82 ÷ 3 ≈ 0.94; The increase of a share of stock is about AED 0.94.**

18. Mohamed is buying a computer that normally sells for AED 890. The sales tax rate is 6%. What is the total cost of the computer including sales tax?


$$890 \times 6\% = 53.4$$
$$890 + 53.4 = 943.4\ AED$$

19. The length of a yard is 2.43 kilometers. Use a mixed number to represent this length?

$$\text{Length} = 2.43 = \frac{2.43}{1} = \frac{2.43\times100}{1\times100} = \frac{243}{100} = 2\frac{43}{100}$$

20. Nadia knitted two scarves for her teddy bears. One was $10\frac{3}{4}$ cm long. The other was $3\frac{1}{8}$ cm shorter than the first. How long was the second scarf?

$$1^{st} = 10\frac{3}{4} = \frac{43}{4}$$

$$\text{The } 2^{nd} \text{ is } 3\frac{1}{8} = \frac{25}{8}\ cm \text{ shorter than the } 1^{st}$$

$$2^{nd} = \frac{43}{4} - \frac{25}{8} = \frac{86}{8} - \frac{25}{8} = \frac{61}{8} = 7\frac{5}{8}$$