United Arab Emirates
Ministry of Education

الإمارات العربية المتحدة
وزارة التربية والتعليم

Subject: Mathematics | **Grade: 10**

Number of Pages: (8) | **Stream: Advanced**

End of Term 1 Exam
Academic Year 2017/2018

1st Question

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Circle the letter corresponding to the correct answer:

1) Choose the correct description of the system of equations $\begin{aligned} 3x+2y&=3 \\ 4x-2y&=4 \end{aligned}$.

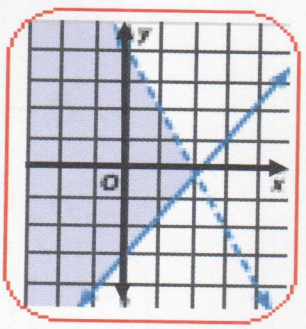
a) Consistent and independent

b) Inconsistent and dependent

c) Independent and inconsistent

d) Consistent and dependent

2) Which system of inequalities is graphed?



a) $y > \frac{3}{2}x - 3$
$y < 4 - 2x$

b) $y \geq \frac{3}{2}x - 3$
$y < 4 - 2x$

c) $y \geq \frac{3}{2}x - 3$
$y \leq 4 - 2x$

d) $y \leq \frac{3}{2}x - 3$
$y > 4 - 2x$

3) Evaluate the determinant $\begin{vmatrix} 2 & 0 & 0 \\ 3 & 2 & 1 \\ 1 & -1 & 5 \end{vmatrix}$.

a) 22

b) 18

c) - 22

d) 20

4) A gas station sells low-grade (L), mid-grade (M), and premium (P) gasoline. Mid-grade costs AED 0.10 per gallon more than low-grade, and premium costs AED 0.10 per gallon more than mid-grade. Three gallons of low-grade gasoline cost AED 20. Which system of equations represents the cost of each type of gasoline?

a) $3L = 20\ ,\ M = L - 0.10,\ P = M - 0.10$

b) $3L + M = 20\ ,\ M = L + 0.10,\ P = M + 0.10$

c) $3L = 20\ ,\ M = L + 0.10,\ P = M + 0.10$

d) $3L = 20\ ,\ M + P = 0.10$

5) Find the y-intercept for the function $f(x) = x^2 + 5x - 6$.

a) $(0, 5)$

b) $(0, 6)$

c) $(0, -6)$

d) $\left(0, \frac{-5}{2}\right)$

6) Find the maximum or minimum value of the function $f(x) = 4x^2 - 24x + 11.$

a) Maximum of 3

b) Minimum of 3

c) Maximum of 4

d) Minimum of 4

7) Which quadratic equation has for roots -1 and 2?

a) $x^2 + x - 2 = 0$

b) $x^2 - 2x + 1 = 0$

c) $x^2 + 2x - 1 = 0$

d) $x^2 - x - 2 = 0$

8) Which value of b makes $x^2 + bx + 9$ a perfect square?

a) 81 b) 9

c) 6 d) 3

9) Simplify $i(2-3i)(2+3i)$.

a) 13 b) -13

c) $-13i$ d) $13i$

10) Simplify $(6a^2+5a+10)-(4a^2+6a+12)$.

a) $2a^2 - a - 2$ b) $10a^2 + 11a + 22$

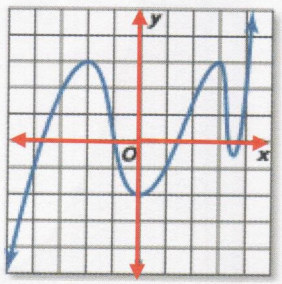
c) $2a^2 - 11a + 22$ d) $2a^2 + a + 2$

11) Determine the degree of the polynomial $2x^3 + 4x^2 - 2x^3 + x - 32$.

a) 2 b) 1

c) 3 d) 4

12) What is the number of real zeros of the graphed function ?



a) 2 b) 3

c) 4 d) 5

13) Given : $f(x)=x^2+5x-2,\ g(x)=3x-2$, find $(f+g)(x)$.

a) x^2+2x-4 b) x^2+8x-4

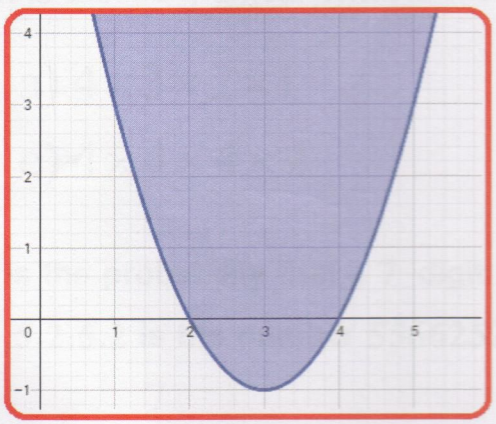
c) x^2-2x d) x^2+8x-2

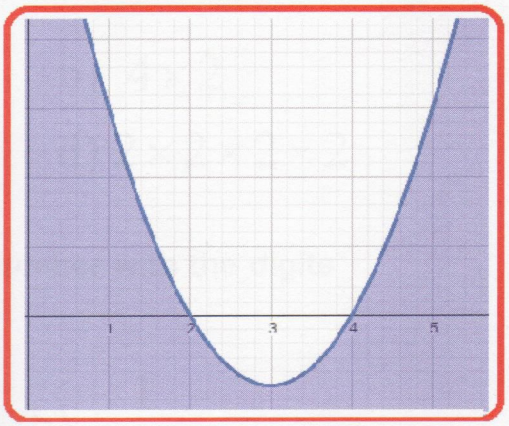
14) Find the inverse of the function $g(x)=3x+1$.

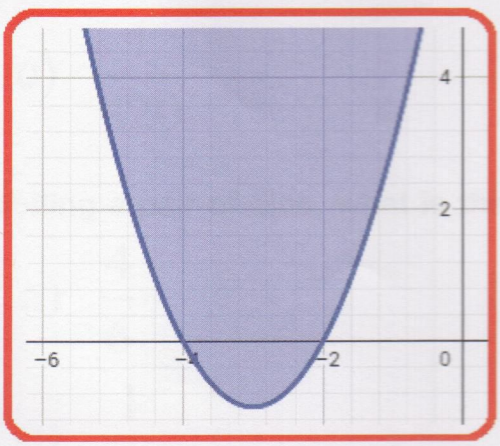
a) $g^{-1}(x)=\dfrac{x-1}{3}$ b) $g^{-1}(x)=\dfrac{x+1}{3}$

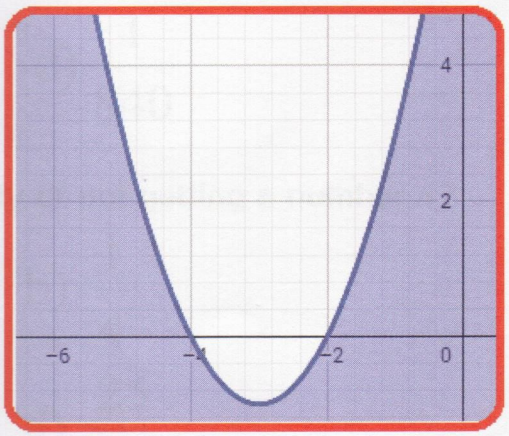
c) $g^{-1}(x)=3x-1$ d) $g^{-1}(x)=x-3$

15) Which region represents the solution for the inequality $y\le x^2-6x+8$?

a) 

b) 

c) 

d) 

16) Simplify $5\sqrt{12a}+2\sqrt{27a}+\sqrt{48a}$.

a) $7\sqrt{89a}$

b) $20\sqrt{3a}$

c) $54a\sqrt{3}$

d) $8\sqrt{3a}$

17) Simplify $\dfrac{x^{\frac{5}{6}}}{x^{\frac{1}{5}}}$.

a) $x^{\frac{6}{11}}$

b) $x^{\frac{13}{15}}$

c) $x^{\frac{19}{30}}$

d) $x^{\frac{31}{30}}$

18) A coin is tossed 4 times. What is the number of possible outcomes?

a) $4\times3\times2\times1$

b) 4×2

c) $4\times4\times4\times4$

d) $2\times2\times2\times2$

19) What is the probability that a 7-digit telephone number with the digits 6,5,6,5,2,5,2 is the number 5566252?

a) $\dfrac{7}{840}$

b) $\dfrac{1}{210}$

c) $\dfrac{1}{420}$

d) $\dfrac{1}{840}$

20) When rolling a pair of dice, what is the probability of not getting a number 4?

a) $\dfrac{4}{6}$

b) $\dfrac{1}{4}$

c) $\dfrac{1}{36}$

d) $\dfrac{25}{36}$

2nd Question **Show all the details when answering these questions.**

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Use the following matrices to find each of the three quantities, if possible.

$$A=\begin{bmatrix}1 & 3\\ 4 & 6\end{bmatrix},\ B=\begin{bmatrix}7 & -4\\ -3 & 8\end{bmatrix},\ C=\begin{bmatrix}5 & 2 & -2\\ 1 & -6 & 4\end{bmatrix}$$

21) $2A-B=$ .....

22) $A\times C=$ .....

23) $A^{-1}=$ .....

24) **Solve the inequality** $\sqrt{3x+3}-1\le 2.$

25) Write the function $y = x^2 - 6x + 7$ in vertex form, then identify the vertex (coordinates), the axis of symmetry, and direction of opening (up or down).

26) Find all the zeros of the function $f(x) = 3x^3 - 8x^2 + 11x - 14$ knowing that $(x - 2)$ is one of its factors.

27) Write a polynomial function with integral coefficients of least degree that has for zeros $-3, 1, -3i$ (use expanded form).

28) Solve the system of equations $\begin{cases} x - y + 2z = 0 \\ 3x + z = 11 \\ -x + 2y = 0 \end{cases}$.

29) A box contains 4 red, 3 white, and 5 blue marbles. What is the probability of drawing, in order, 2 red and 2 blue marbles without replacement?

End of Exam

Good Luck