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Student Name: \_\_\_\_\_ Class: \_\_\_\_\_

## Revision Worksheet

### Grade 10 Advanced Mathematics (2019-2020)

#### Chapter 4: Inverses and Radical functions and relations

*Instructions: Read all questions carefully. Answer all questions*

Chapter:4, 4.1

1. If  $f(x) = x - 1$  and  $g(x) = 5x - 2$  then Find

a)  $(f + g)(x)$

c)  $(f - g)(x)$

b)  $(f \cdot g)(x)$

d)  $\left(\frac{f}{g}\right)(x)$

2) Find  $f \circ g$  and  $g \circ f$

a) If  $f = \{(-8, -4), (0, 4), (2, 6), (-6, -2)\}$

$g = \{(-4, -4), (-2, -1), (-4, 0), (6, -5)\}$

b)  $f = \{(-7, 0), (4, 5), (8, 12), (-3, 6)\}$

$g = \{(6, 8), (-12, -5), (0, 5), (5, 1)\}$

3) If  $f(x) = x^2$  ,  $g(x) = -x + 1$  then find

a)  $f \circ g(x)$

b)  $g \circ f(x)$

c)  $f(g(-2))$

d)  $f(g(3a))$

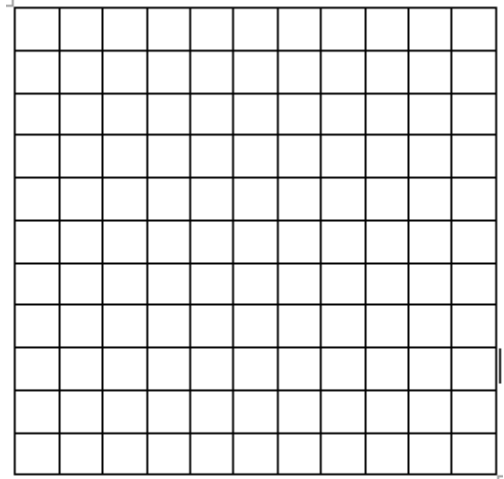
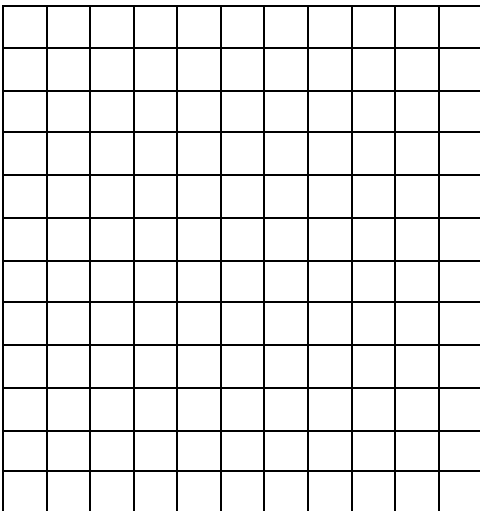
## 4.2

1) Find the inverse relation.  $\{(-7, 0), (4, 5), (8, 12), (-3, 6)\}$

2) Find the inverse function. Then graph the function and its inverse function.

a)  $f(x) = -\frac{5}{3}x - 8$

b)  $f(x) = x^2 - 3$



3) Determine whether each pair of functions are **inverse functions**. Write yes or no

a)  $f(x) = \frac{1}{2}x + 5$

$$g(x) = 2x - 10$$

b)  $f(x) = 3x + 2$

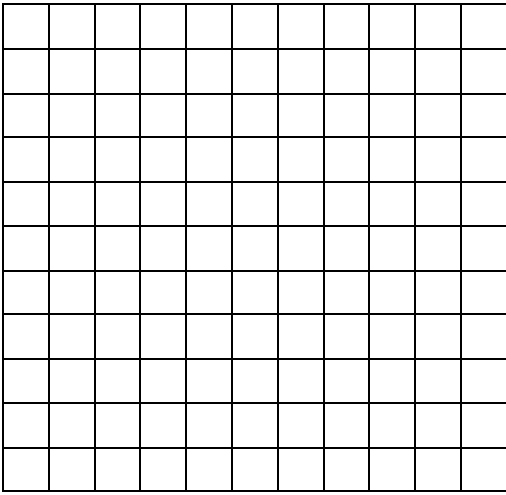
$$g(x) = x^2 - 2$$

### 4.3

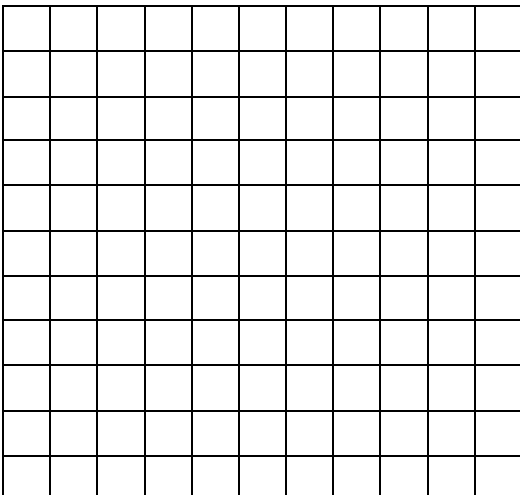
1) Identify domain and range of  $f(x) = \sqrt{x+6} + 2$

2) Graph the function. State domain and range of a function.

$$f(x) = 3 \cdot \sqrt{x-1}$$



3) Graph the inequality  $f(x) > \sqrt{2x-1} - 3$



#### 4.4 $N^{\text{th}}$ Roots

1) Simplify

a)  $\pm\sqrt{121 x^4 y^{16}}$

b)  $-\sqrt{(x^2 + 16)^{12}}$

c)  $\sqrt[3]{8a^6 b^{12}}$

d)  $\sqrt[4]{256 (5x - 12)^{12}}$

e)  $\sqrt{-64y^8 z^6}$

f)  $\sqrt[7]{(x - 12)^{63}}$

2) Use a calculator to approximate each value to three decimal places.

a)  $\sqrt{92}$

b)  $\sqrt[6]{(8912)^2}$

3)

The surface area of a sphere can be determined from the volume of the sphere using the formula  $S = \sqrt[3]{36\pi V^2}$ , where  $V$  is the volume. Determine the surface area of a sphere with a volume of 200 cubic centimeters.

#### 4.5 Operations with radical expressions

##### 1. Simplify

a)  $\sqrt{144x^7 y^5}$

b)  $\frac{\sqrt{c^9}}{\sqrt{a^9}}$

c)  $\sqrt[4]{\frac{5x}{8y}}$

d)  $5 \cdot \sqrt{2x} \cdot 3 \sqrt{8x}$

d)  $3 \cdot \sqrt[3]{36xy} \cdot 2 \sqrt[3]{6x^2y^2}$

e)  $(4 + 2\sqrt{5})(3\sqrt{3} + 4\sqrt{5})$



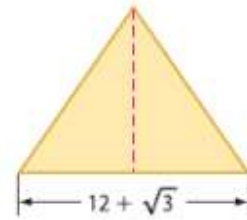
f)  $\frac{5}{\sqrt{2+3}}$

g)  $4\sqrt{40} - \sqrt{200}$

h)  $\frac{x+1}{\sqrt{x-1}}$

3)

**GEOMETRY** Find the altitude of the triangle if the area is  $189 + 4\sqrt{3}$  square centimeters.



## 4.6 Rational Exponents

Write each expression in radical form, or write each radical in exponential form.

1.  $10^{\frac{1}{4}}$

2.  $x^{\frac{3}{5}}$

3.  $\sqrt[3]{15}$

4.  $\sqrt[4]{7x^6y^9}$

2) Evaluate each expression

a)  $81^{-\frac{1}{4}}$

b)  $256^{\frac{1}{4}}$

3) Simplify

$a^{\frac{3}{4}} \cdot a^{\frac{1}{2}}$	$\frac{x^{\frac{4}{5}}}{x^{\frac{1}{5}}}$	$\frac{b^3}{c^{\frac{1}{2}}} \cdot \frac{c}{b^{\frac{1}{3}}}$	$\sqrt[4]{98^2}$	$\frac{g^{\frac{1}{2}} - 1}{g^{\frac{1}{2}} + 1}$
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4) Find the radius  $r$  of the sphere with Volume  $V$  is given by  $r = \left(\frac{3v}{4\pi}\right)^{\frac{1}{3}}$ . Find the radius of a ball with a volume of  $77\text{cm}^3$

#### 4.7 Solving Radical equations and inequalities.

1) Solve the following equations:

a)  $\sqrt{2x+5} - 4 = 3$

d)  $\sqrt{x-3} = \sqrt{x+4} - 1$

b)  $(4y)^{\frac{1}{3}} + 3 = 5$

e)  $\sqrt[3]{n+8} - 6 = -3$

c)  $(2y+6)^{\frac{1}{4}} - 2 = 0$

f)  $\sqrt{2t-7} = \sqrt{t+2}$

2) Solve each inequality

a)  $\sqrt{3x + 4} - 5 \leq 4$

b)  $2 + \sqrt{4y - 4} \leq 6$

c)  $-2 + \sqrt{9 - 5x} \geq 6$