

Final Exam Review 5

1) Using exponents for any repeat numerical factors, find the prime factorization of  $96x^4y^3$ .

$2^5 \cdot 3 \cdot x \cdot x \cdot x \cdot y \cdot y \cdot y$

$2^{4+1} \cdot 3 \cdot 2 \cdot 2 \cdot 2$   
 $2^5 \cdot 3 \cdot 2^3$

2) How much greater is  $4.6 \times 10^5$  than  $13.2 \times 10^3$ ? Express your answer in scientific and standard notation.

$4.468 \times 10^5$   
 or  
 446,800 times larger

To top -  
 Get powers to be the same

Big - Little  
 $4.6 \times 10^5 - 13.2 \times 10^3$   
 $4.600 \times 10^5 - 0.132 \times 10^5$   
 $(4.600 - 0.132) \times 10^5 = 4.468 \times 10^5$

3) Referring to the diagram below,  $\angle A = 8x + 12$  and  $\angle B = 2x - 2$ . What is the measure of the angle opposite  $\angle A$ ?

148



Vertical angles are congruent

Supplementary angles add to 180  
 $\angle A + \angle B = 180$   
 $(8x + 12) + (2x - 2) = 180$   
 $10x + 10 = 180$   
 $10x = 170$   
 $x = 17$

m  $\angle A$  = angle opp.  $\angle A$   
 $8(17) + 12$   
 $136 + 12$   
 148

$5x^8 - 1$

4) What is the simplified form of the expression  $\frac{10x^{10} - 2x^2}{2x^2}$ ?

$\frac{10x^{10} - 2x^2}{2x^2}$

$\frac{10}{2}x^{10-2} - 1$   
 $5x^8 - 1$

any #  $\div$  by itself is 1

5)  $2(c^2 + b) = 2c^2 + 3b$  is an example of which property?

Distributive Property

6) What is the equation that represents the relationship between x and y?

x	2	4	6	8	10
y	8	10	12	14	16

Function Rule  
 Find slope and y-int

$m = \text{slope} = \frac{\Delta y}{\Delta x} = \frac{+2}{+2} = 1$   
 $b = y\text{-int.} = ?$

Choose on  $(x, y) = (8, 14)$   
 $14 = (1)(8) + b$   
 $14 = 8 + b$   
 $6 = b$

$y = 1x + 6$

7) On the highway, Maya traveled 18 miles in 20 minutes. What was the average speed of her car in miles per hour?

54 mph

$$\frac{18 \text{ miles}}{20 \text{ mins}} = \frac{x \text{ miles}}{60 \text{ mins}}$$

$$20x = 18(60)$$

$$20x = 1080$$

$$\frac{20x}{20} = \frac{1080}{20}$$

$x = 54$  miles in 60 minutes  
 $x = 54$  miles in 1 hour

8) Find the difference:  $(3x^2 + 14x - 1) - (4x^2 + x - 8)$

$-x^2 + 13x + 7$

$$3x^2 + 14x - 1 - 4x^2 - x + 8$$

$$3x^2 - 4x^2 + 14x - x - 1 + 8$$

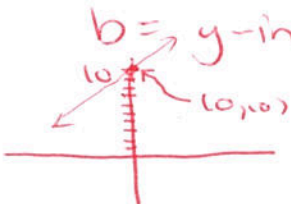
$$-1x^2 + 13x + 7$$

9) a. Determine the slope in the equation  $y - x = 10$ .

Slope:  $m = 1$

b. What are the coordinates of the y-intercept of this line?

$(0, 10)$



$y = ax + bx + c$   
 quadratic

10) Which equation would result in the graph of a parabola?

a

- a)  $y = -x^2 + 2$     b)  $y = 5 - 2x$     c)  $y = 7x + 2$     d)  $y = x^3$

line

11) What is the product of  $(3x - 1)$  and  $(2x - 7)$ ?

$6x^2 - 23x + 7$

multiply

$$(3x - 1)(2x - 7)$$

F O I L

$$6x^2 - 21x - 2x + 7$$

or

$3x$	$-1$
$2x$	$-7$
$6x^2$	$-21x$
$-2x$	$+7$

12) If  $x = -2$ , find the value of  $5x^2 - x + 6$ .

28

Expos before multiplication

$$5(-2)^2 - (-2) + 6$$

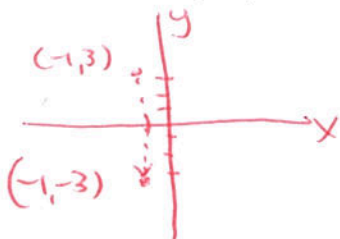
$$5(4) + 2 + 6$$

$$20 + 8$$

$$28$$

13) If  $(-1, 3)$  is reflected in the x-axis, what are the coordinates of the image point?

$(-1, -3)$



$(x, y) \xrightarrow{r_x} (x, -y)$

$(-1, 3) \xrightarrow{r_x} (-1, -3)$

6

14) Compare the following functions to determine which statement about the rate of change is TRUE.

r.o.c : slope :  $\frac{\Delta y}{\Delta x}$

A					B	
x	0	1	2	3	$2y + 3x = 2$	
y	16	14	12	10	$\frac{dy}{dx} = \frac{-3x+2}{2}$	

$roc = \frac{\Delta y}{\Delta x} = \frac{-2}{1} = -2$

$y = -\frac{3}{2}x + 1$   
 $m = -\frac{3}{2} = -1.5$

- a) The rate of change of A is greater than the rate of change of B.
- b) The rate of change of B is greater than the rate of change of A.  $B > A$  (less negative)
- c) The rate of change of A is equal to the rate of change of B.
- d) There is not enough information to determine the relationship.

15) Solve the system of equations, **algebraically**.

$x = -1, y = 3$   
 $(-1, 3)$

Elimination

$$\begin{array}{r} -2(2x + 8y = 22) \\ 6x + 16y = 42 \\ \hline -4x - 16y = -44 \\ + 6x + 16y = 42 \\ \hline 2x = -2 \\ x = -1 \end{array}$$

$$\begin{array}{r} 2x + 8y = 22 \\ 2(-1) + 8y = 22 \\ -2 + 8y = 22 \\ 8y = 24 \\ y = 3 \end{array}$$

Check  $(-1, 3)$ ?

$$\begin{array}{r} 2(-1) + 8(3) = 22 \\ -2 + 24 = 22 \\ 22 = 22 \\ \checkmark \end{array}$$

$$\begin{array}{r} 6(-1) + 16(3) = 42 \\ -6 + 48 = 42 \\ 42 = 42 \\ \checkmark \end{array}$$

16) A ball has a diameter of 4.6 inches. Find the volume of the ball to the hundredth of a cubic inch.

$V \approx 407.72$   
 $in^3$

Sphere

$$\begin{aligned} V &= \frac{4}{3} \pi r^3 \\ V &= \left(\frac{4}{3}\right)(\pi)(4.6)^3 \\ V &= \left(\frac{4}{3}\right)(\pi)(97.336) \\ V &= 407.7208 \end{aligned}$$

## FORMULA SHEET

Rectangular Prism

$$V = lwh$$

$$SA = 2lw + 2lh + 2hw$$

Cylinder

$$V = \pi r^2 h$$

Cone

$$V = \frac{1}{3} \pi r^2 h$$

Sphere

$$V = \frac{4}{3} \pi r^3$$

Pythagorean Theorem

$$a^2 + b^2 = c^2$$

