

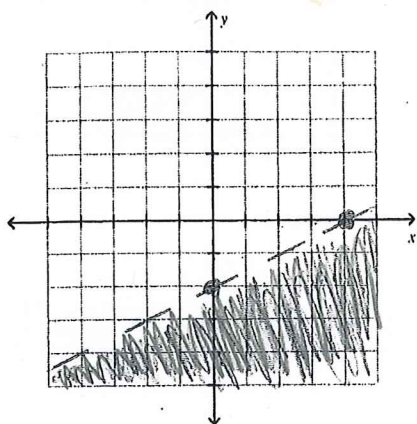
Full Name: _____ Period: _____ ID: A

"If you tell the truth, you don't have to remember anything." - Mark Twain

Final Exam Review C - Algebra 8r

Short Answer

1. On the grid to the right, sketch the graph of the inequality: $3x - 6y > 12$



x	y
0	-2
4	0

Test (0, 6)

$$3(0) - 6(6) > 12$$

$$0 - 36 > 12$$

$$-36 > 12$$

False, so (0, 6)

NOT solution &

shade other $\frac{1}{2}$ plane

2. A rare insect population begins dying at an alarming rate, exponential decay. After one day there are 84600 still alive, after two days there are 60912 remaining.

- a.) What is the decay factor?

$$\frac{y_2}{y_1} = \frac{60912}{84600} = 0.72$$

- b.) What is the rate of decay?

$$1 - 0.72 = 0.28 \text{ or } 28\%$$

- c.) Write the equation that models the number of insects, I , still alive after d days.

$$y = a(b)^x$$

\downarrow start \downarrow factor

1st find start

2nd $y = 11750(.72)^d$

$I = 11750(.72)^d$

x	y
0	11750
1	84600
2	60912

$$84600 \div 0.72 = 11750$$

3. Write an equivalent expression for $5x^2 - 125$ in its completely factored form.

$$5(x^2 - 25) =$$

$$5(x+5)(x-5)$$

4. A Jolly Rancher candy is thrown into the air from the ground. The height, h , of the candy in feet after t seconds can be represented by the equation $h = -16t^2 + 24t$.

a.) What is the maximum height the candy will reach, and when will it reach this height?

L.O.S.

$$x = \frac{-b}{2a} = \frac{-24}{2(-16)} = 0.75$$

$$h = -16(.75)^2 + 24(.75) = 9$$

max height 9 feet @ .75 seconds

b.) How long will the candy be in the air before it hits the ground?

$$0 = -16t^2 + 24t$$

$$0 = -8t(2t - 3)$$

$$\downarrow \quad \quad \downarrow$$

$$t = 0 \quad \quad t = 1.5$$

hit ground 1.5 seconds

5. Solve by any method: $2x^2 + 5x = 3$

use formula or factor

$$(2x-1)(x+3) = 0$$

$$\downarrow \quad \quad \downarrow$$

$$1/2 \quad \text{or} \quad -3$$

6. The WMS golf team held a talent show fund raiser this spring. Tickets cost \$5 for students and \$10 for adults. After the show, Mrs. Smoler found that the team had sold 569 tickets and raised \$3425. Write a system of linear equations that you could use to determine how many student tickets and adult tickets were sold for the show. Define your variables on the first two lines. YOU DO NOT NEED TO SOLVE THIS SYSTEM.

$$x = \text{students}$$

$$y = \text{adults}$$

$$\begin{cases} 5x + 10y = 3425 \\ x + y = 569 \end{cases}$$

7. Solve the following system of linear equations using any method except for guess and check. Show all your work.

$$\begin{cases} 4x - 3y = 25 \\ -3x + 8y = 10 \end{cases} \Rightarrow \begin{array}{r} 12x - 9y = 75 \\ -12x + 32y = 40 \\ \hline 23y = 115 \\ \Rightarrow y = 5 \end{array}$$

$$4x - 3(5) = 25$$

$$4x - 15 = 25$$

$$\Rightarrow 4x = 40$$

$$\Rightarrow x = 10$$

$(10, 5)$

8. Solve for x : $9x + 69 = 16 - 7(7 - x)$

$$9x + 69 = 16 - 49 + 7x$$

$$\Rightarrow 2x + 69 = 16 - 49$$

$$\Rightarrow 2x = -102$$

$x = -51$

9. Find the product: $(4x^3)(-6x^5)^2$

$$(4xxx)(-6xxxxxx)(-6xxxxxx)$$

$144x^{13}$

10. A toe nail has an approximate radius of 4.5928×10^{-3} . What is this number in standard form?

0.0045928

3

11. Evaluate the following expression: $4^{-2} \cdot 8^0 \cdot 4^4$

$$\frac{1}{4^2} \cdot 1 \cdot 4^4 = 4^2 = 16$$

12. Simplify the following expression: $\frac{x^2 y^3}{x^{-3} y^9}$

$$= \frac{x^3 x^2 y^3}{y^9} = \frac{x^5}{y^6}$$

13. $(4x^4 + 5x^3 + x + 7) - (2x^4 - 5x^3 + 4) =$

$$2x^4 + 10x^3 + x + 3$$

14. $(x+y)^2 =$

$$(x+y)(x+y) = x^2 + 2xy + y^2$$

$(x-y)^2 =$

$$(x-y)(x-y) = x^2 - 2xy + y^2$$

15. Solve for c in terms of d and e : $12 = \frac{9c-d}{e}$

$$\Rightarrow 12e = 9c - d$$

$$\Rightarrow 12e + d = 9c \Rightarrow \frac{12e}{9} + \frac{d}{9} = c$$

$$\frac{4e}{3} + \frac{1}{9}d = c$$

16. What is the slope of the line represented by: $x - 3y = 15$

$$\Rightarrow 3y = x - 15$$

$$\Rightarrow y = \frac{1}{3}x - 5$$

$$m = \frac{1}{3}$$

17. What is the x -intercept of the line represented by the equation $x - 3y = 15$

$$x - 3(0) = 15$$

$$x = 15$$

$$(15, 0)$$

18. What is the y -intercept of the line represented by the equation $x - 3y = 15$

$$(0) - 3y = 15$$

$$\Rightarrow y = -5$$

$$(0, -5)$$

19. Office Max sells a box of gum at a discount for all WMS students if you buy more than one box. The first box costs \$36.50, but each additional box only cost \$15.50. What is the equation that represents the total cost, c , for the number of boxes, b of gum at Office Max?

b	c
0	.
1	36.50
2	52

$$y = mx + b$$

↓
slope

↓
y-int

$$m = 15.50$$

$$c = 15.50b + 21$$

20. What is the equation of the line passing through the points $(6, -26)$ and $(-9, -44)$?

$$m = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-44 - (-26)}{-9 - 6} = \frac{-18}{-15} = \frac{6}{5}$$

$$y = mx + b \Rightarrow (-26) = \left(\frac{6}{5}\right)(6) + b$$

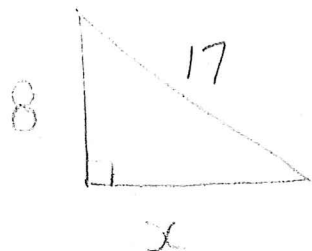
$$-26 = \frac{36}{5} + b \Rightarrow b = -33.2$$

$$y = \frac{6}{5}x - 33.2$$

$$y = 1.2x - 33.2$$

21. What is the length of the missing side for the triangle?

with one leg being 8 feet and the hypotenuse being 17 feet?



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

$$8^2 + b^2 = 17^2$$

$$\Rightarrow b^2 = 17^2 - 8^2$$

$$b^2 = 225$$

$$b = 15 \text{ feet}$$

22. Given en the following quadratic equation: $y = x^2 + 6x - 7$

a.) Calculate the x-intercepts.

$$(-7, 0) \text{ \& } (1, 0)$$

$$y = (x+7)(x-1)$$
$$0 = (x+7)(x-1)$$

b.) Calculate the y-intercept.

$$(0, -7)$$

$$y = (0)^2 + 6(0) - 7 = -7$$

c.) Write the equation for the line of symmetry.

$$x = \frac{-b}{2a} = \frac{-6}{2(1)} = -3$$

$$x = -3$$

d.) Find the coordinate for the vertex of the parabola.

$$y = (-3)^2 + 6(-3) - 7$$
$$= 9 - 18 - 7 = -16$$

$$(-3, -16)$$

e.) State whether the parabola opens up or down.

$a > 0$ so opens up. 