

NAME: _____

Advanced Pre-Calculus Summer Work

The following worksheets contain Algebra II practice problems that will help you review and get prepared for the Advanced Pre-Calculus class in the fall.

- 1) Solve all problems, showing work to justify your answers. You may need to attach extra paper. (Check your answers when possible.)
- 2) Bring the completed packet to the first day of class next year.
- 3) If you don't remember how to do a particular type of problem, you can find help online at sites such as Khan Academy <https://www.khanacademy.org>, Hippocampus <http://www.hippocampus.org> and WebMath <http://www.webmath.com/>.
- 4) If you lose or misplace the worksheets, then you can find them on line by logging into the Mt. Ararat High School Website and scrolling to the Math Department page.

Advanced Pre-Calculus

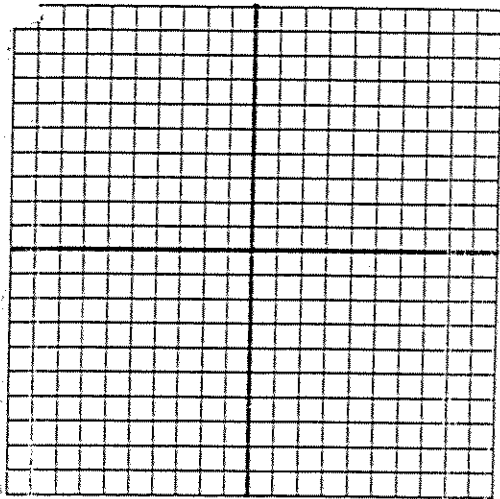
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Worksheet #1 Review

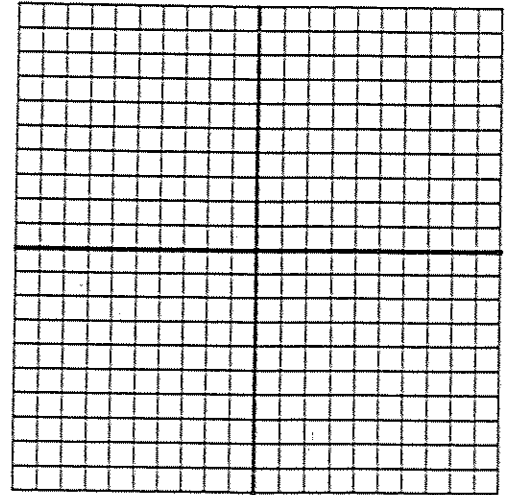
(Show all of your work on this packet.)

1. Is the point $(7, -2)$ on the graph of $3x - 5y = 3$? _____ Is the point $(-4, -3)$? _____
Explain how you get your answers.

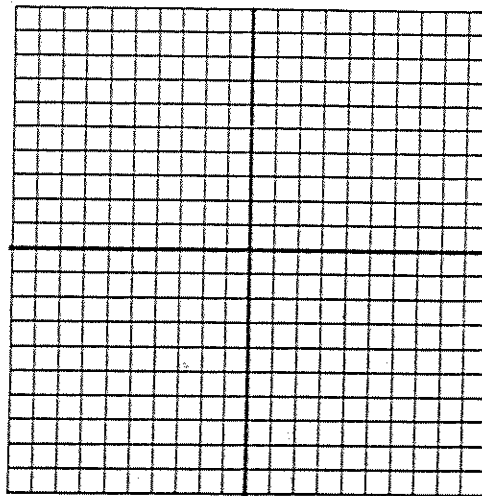
2. Graph the equation $3x + y = 8$.



3. Graph the line $y = -4x$.



4. Graph $y = 5$ and $x = -6$ on the same Cartesian coordinate plane.



5. What is the slope of the line between the two points $(4, 8)$ and $(4, -1)$? _____ What type of line is this? _____
6. For what value of k will the three points $(5, 2)$ $(-2, -4)$ and $(k, 20)$ be on the same line? _____

7. What is the slope and the y-intercept of each of the following equations?

a) $y = 2x - 8$

b) $x = 14$

slope: _____ y-int: _____

slope: _____ y-int: _____

c) $9x + 3y = 18$

d) $2.66x = 15 - 4.2y$

slope: _____ y-int: _____

slope: _____ y-int: _____

8. For each of the following equations, find the x-intercept(s) and the y-intercept(s). Show all of your work.

a) $y = -13$

b) $x/a + y/b = 1$

x-int: _____ y-int: _____

x-int: _____ y-int: _____

c) $5x + 4y = -16$

d) $1.6y = 44 + 3.2x$

x-int: _____ y-int: _____

x-int: _____ y-int: _____

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Worksheet #2 Review

(Show all of your work on this packet)

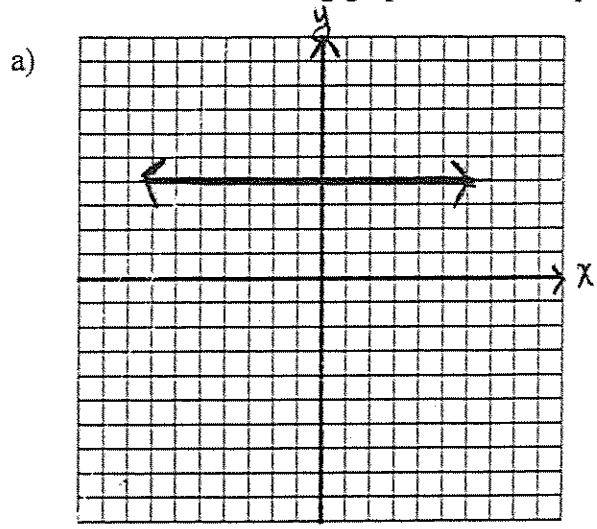
9. Given the equation $\frac{5}{4}x - \frac{5}{2}y = 6$, find each of the following:

a) The slope of the line: _____

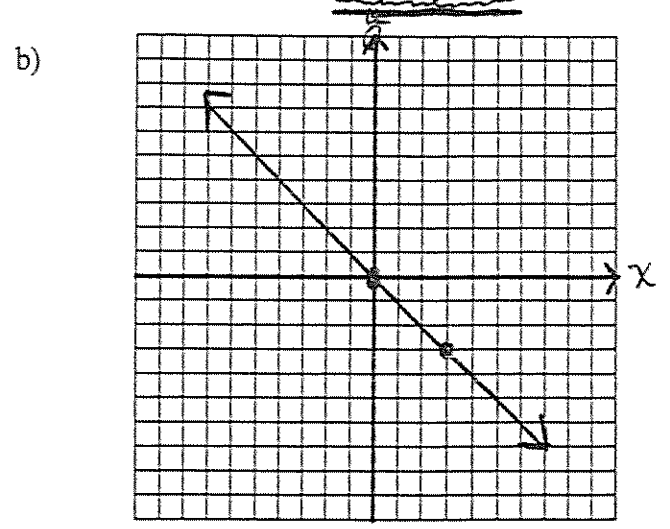
b) The slope of any line parallel to the given equation: _____

c) The slope of any line perpendicular to the given equation: _____

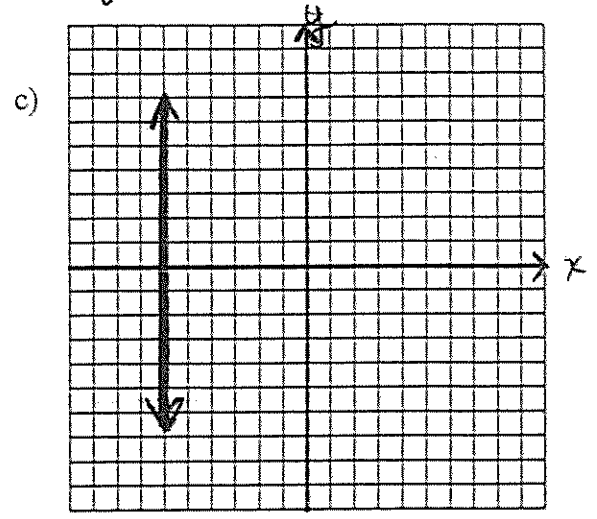
10. For each of the following graphs, find the equation of the line in the form $Ax + By = C$



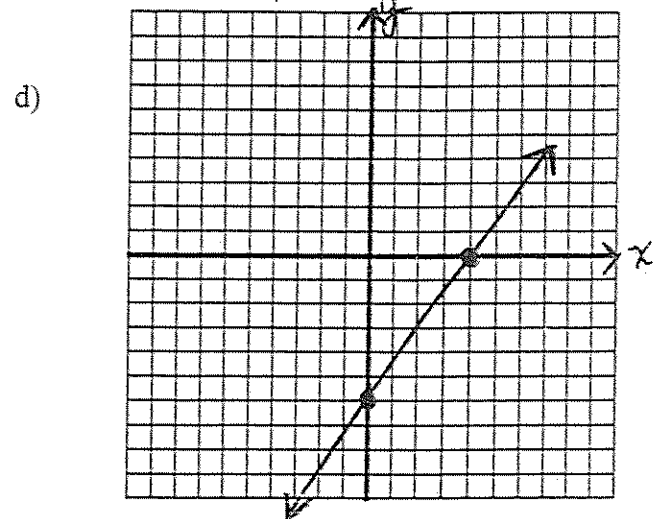
Equation: _____



Equation: _____



Equation: _____



Equation: _____

11. Find the equation of the following lines described below:

a) The line passes through the points $(-3.4, 6)$ and $(1.6, 8)$. _____

b) There is **no slope** and the line passes through the point $(222, -456)$. _____

c) The line is **parallel** to $y = \frac{2}{3}x + 17$ and passes through the point $(-18, 7)$. _____

d) The line is **perpendicular** to $\frac{2}{3}x + y = 44$ and passes through the point $(25, -3)$. _____

12. A manufacturer has fixed costs (such as rent and insurance) of \$3550 per month. The cost of producing each unit of goods is \$8.50.

a) What is the linear equation for the cost of producing x units per month? _____

b) What will be the cost of producing 548 units per month? _____

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Simplify the expression.

(Leave no negative exponents!)

a) $(2x^3)^5$ _____

b) $(3x)(5x^2)^2$ _____

c) $\frac{(6x^2)^2}{12x^2}$ _____

d) $\left(\frac{x^3}{y^5}\right)^6 \cdot \left(\frac{y^2}{x^4}\right)^5$ _____

e) $7x^{-5} \cdot 5x^{-6}$ _____

f) $10x^{-3} \cdot 3x^{10}$ _____

g) $(-3x)^2 (-2x^{-4}y^2)^3$ _____

h) $(6x^3y^{-2})^2 (3x^{-5}y^3)^2$ _____

i) $(12x^3y^{-4}) \div (20x^5y^{-4})$ _____

j) $\frac{6}{x^{-2}} + \frac{5}{x^{-2}}$ _____

14

Write as a single log

a) $\log_2 3 + \log_2 5$ _____

b) $\log_5 4 + \log_5 8 - \log_5 2$ _____

c) $3 \log_{12} 6 - \log_{12} 4$ _____

d) $\log_2 625 - \log_2 125 + 3 \log_2 3$ _____

e) $\log_3 6 + \log_3 7$ _____

f) $\log_7 64 - \log_7 4 + \log_7 5$ _____

g) $6 \log_5 4$ _____

h) $7 \log_3 2 - \log_3 8$ _____

Solve for x

i) $\log_{32} 4 = x$ _____

j) $\log_{216} x = -\frac{2}{3}$ _____

k) $\log_x 625 = \frac{4}{3}$ _____

l) $\log_{81} \frac{1}{27} = x$ _____

m) $\log_3 x = 1$ _____

n) $\log_r \frac{1}{5} = -\frac{1}{4}$ _____

o) $\log_r 243 = \frac{5}{6}$ _____

p) $\log_r 2 = \frac{1}{4}$ _____

q) $\log_{64} \frac{1}{2} = x$ _____

r) $\log_{1000} x = -\frac{2}{3}$ _____

s) $\log_x 8 = \frac{3}{5}$ _____

t) $\log_{16} 64 = x$ _____

u) $\log_{32} x = \frac{7}{5}$ _____

v) $\log_{125} \frac{1}{25} = x$ _____

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Worksheet #3 Review

(Show all of your work on this packet)

15. One-day car rentals cost \$75 plus \$0.15 per mile from company A and \$35 plus \$0.35 per mile from company B.

- a) For each company, give the linear equation for the cost c , when m miles are driven.
(Show all your work.)

Company A: _____

Company B: _____

- b) For what mileage do the two companies offer the same value? _____

16. Factor each of the following completely.

a) $x^2 - 6x + 8$

b) $y^2 + 8y - 20$

c) $2x^2 - 11x - 21$

d) $15m^2 + 16m - 7$

e) $24w^2 + 38w + 15$

f) $4s^2 - 79s - 20$

g) $m^3 - 64$

h) $8x^3 + 27y^3$

17. Solve each of the following equations below: (Show all the work and check your answers.)

a) $|4x + 5| = 8$ _____

b) $|3x - 7| \leq 14$ _____

c) $|x + 8| > 2x - 12$ _____

d) $2x^2 = 14x - 18$ _____

e) $4y(y - 3.5) + 3(7 - 2y) = 0$ _____

f) $\frac{x + 5}{2x + 5} = \frac{2x - 8}{x - 2}$ _____

g) $\frac{x^2 + 2}{6} = \frac{4x}{3} + \frac{5}{4}$ _____

h) $3w^3 - 17w^2 + 20w = 0$ _____

18. State the domain and range of each relation. Determine whether the relation is a function.

a) $(2, 5), (-2, 5), (-3, 7), (3, 7)$

domain _____
 range _____
 function _____

b) $y = x^2 + 1$

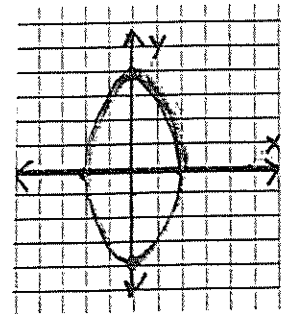
domain _____
 range _____
 function _____

c) $x = 5$

domain _____
 range _____
 function _____

d)

domain _____
 range _____
 function _____



19. State the domain of the function.

a) $f(x) = \sqrt{x^2 - 16}$ _____

b) $g(x) = \frac{1}{x^2 - 2}$ _____

20. Evaluate each function for the given value.

a) $f(2)$ if $f(x) = (x - 5)^2$ _____

b) $g(2b)$ if $g(x) = 2x - 1$ _____

c) $h(x + 3)$ if $h(x) = x^2 - 1$ _____

21. Let $f(x) = x^2 - 3x + 2$ and $g(x) = x - 2$. Find each composite.

[Hint: $(f \circ g)(x) = f(g(x))$]

a) $(f \circ g)(10)$ _____

b) $(g \circ f)(-1)$ _____

c) $(f \circ g)(x)$ _____

d) $(g \circ f)(x)$ _____