

GOOD COUNSEL MATH DEPARTMENT

Summer Math Packet for Students entering

Algebra 2

The problems in this packet are meant to help you review material that you have learned in previous math courses and will need to understand in order to be successful in Algebra 2. Try to complete all problems without a calculator. Show all of your work on a separate sheet of paper. ALL work should be completed to the best of your ability. **You will be tested on the material during the first two weeks of school.**

Have a great summer. We are looking forward to seeing you this fall.

Student Name _____

Previous Course Taken _____

Geometry Formulas:

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

$$\sin \theta = \frac{\textit{opposite}}{\textit{hypotenuse}}$$

$$\cos \theta = \frac{\textit{adjacent}}{\textit{hypotenuse}}$$

$$\tan \theta = \frac{\textit{opposite}}{\textit{adjacent}}$$

Algebra Reminders:

Slope intercept form of a line: $y = mx + b$

$$\textit{slope} = \frac{y_2 - y_1}{x_2 - x_1}$$

When solving a quadratic equation, it first must equal zero.

$$\text{Quadratic Formula } x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x^a \cdot x^b = x^{a+b}$$

$$(x^a)^b = x^{ab}$$

$$\frac{x^a}{x^b} = x^{a-b}$$

1. Solve the following equations and inequalities:

a. $-2(2x + 3) - 4 = 2$

b. $\frac{3}{4}(4x + 16) = -2x + 7$

c. $\frac{x-2}{x+3} = \frac{5}{6}$

d. $|x-3| = 4$

e. $14 - 8x < 12$

f. $5x + 7 - 3x > -1$

g. $-2 < 4x - 6 < 18$

2. A line contains the point $(-3, 6)$ and $(3, 4)$.

a. Find the slope of the line.

b. Write the equation of the line in $y = mx + b$ form.

3. A line passes through the point $(2, 8)$ and is parallel to $y = 3x + 10$. Write the equation of the line.

4. A line passes through the point $(-2, -5)$ and is perpendicular to the line $-2x + y = 9$

5. Solve the following equations for the y .

a. $-2x - 6y = 12$

b. $3x - y = 1$

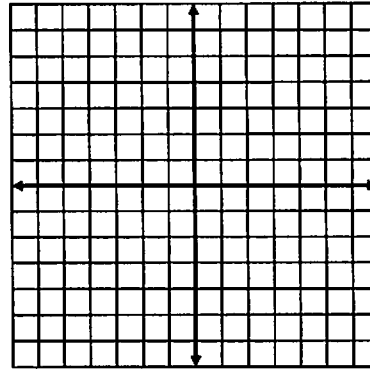
c. $\frac{x+y}{2} = 9$

6. Find the x and y intercepts for the following linear equations.

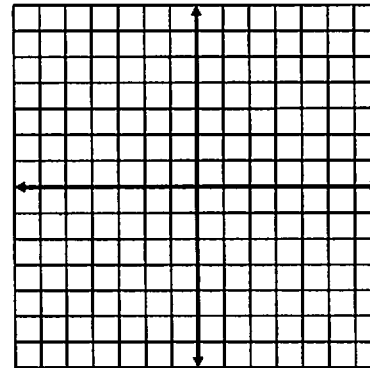
a. $2x + y = 8$

b. $5y = 4x + 20$

7. Graph: $y = -\frac{1}{2}x - 1$



8. Graph: $x + 3y > 9$



9. Solve the following systems of equations.

a. $y = 3x + 8$
 $4x + 2y = 6$

b. $5x + 2y = 7$
 $4x + y = 8$

c. $2x - 4y = -18$
 $-5x - 6y = -3$

10. Factor completely:

a. $8ab + 2a^2b^2$

b. $x^2 - 3x - 4$

c. $x^2 - 144$

d. $4x^2 - 12x + 8$

e. $x^3 + 4x^2 + 3x$

11. Solve by factoring.

a. $x^2 + 11x + 30 = 0$

b. $x^2 + 4x = 21$

c. $5x^2 - x = 4$

d. $3x^2 + 15x = 0$

12. Solve using the quadratic formula. Round your answer to 2 decimal places.

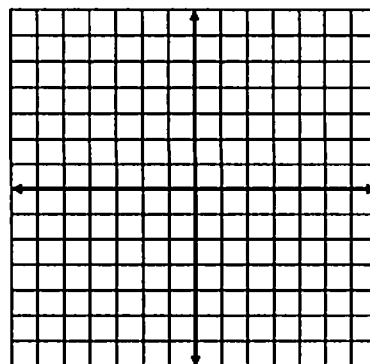
a. $x^2 + x - 3$

b. $-2x^2 + 4x - 1$

13. Graph. $y = -x^2 + 4$

Vertex: _____

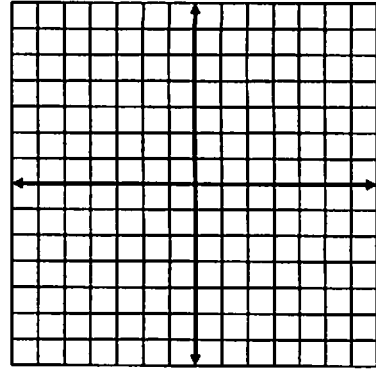
X Intercepts: _____



14. Graph. $y = (x - 1)^2 + 2$

Vertex: _____

X Intercepts: _____



15. Simplify the expressions:

a. $(x^3 + 3x^2 - 2) + (5x^3 + x + 8)$

b. $(x + 2)(x - 5)$

c. $(x + 6)^2$

d. $(3x - 4y)(2x - y)$

e. $(x^3 - 3)(4x + 1)$

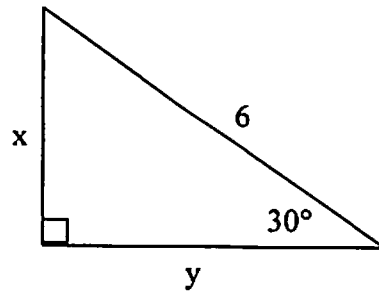
f. $2(x^3 - 5x^2 + 6x) - (x^2 + 3x)$

g. $x^3 \cdot x^2 \cdot x$

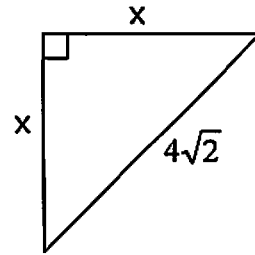
h. $(2x^4)^3$

i. $\frac{3xy^5}{12x^2y^3}$

16. Find the value of x and y.



17. Find the value of x .



18. If a right triangle has a hypotenuse with a length of 12 and a leg with a length of 6, find the length of the other leg using Pythagorean theorem.

19. Simplify.

a. $\sqrt{8}$

b. $\sqrt{54}$

c. $4\sqrt{12}$