

2009 Summer Packet

Name _____

Honors Geometry - This packet is due on the first day of class.

There will be a quiz on the first day of class on this material. If you have any questions as you work on this packet, please email the Geometry Honors lead teacher, danny.kallick@fcps.edu (I may not answer right away in July). This packet is worth 30 points (same as quiz).

A. Simplify:

1. $\frac{0}{15}$

2. $\frac{15}{0}$

3. -5^2

4. $(-5)^2$

5. $(2+3) \cdot 4 - 5$

6. $2 + 3 \cdot 4 - 5$

7. $2 \cdot 3(4 - 5)$

8. $2 + 6 \div 3 \cdot 2$

Solve each equation and inequality for X:

9. $10x = 5$

10. $2x - 1 = 3x + 4$

11. $2x + 1 = 2x + 3$

12. $-\frac{2}{5}x = 12$

13. $4x = 3(4x - 3)$

14. $2x + 4 = 2(x + 2)$

15. $7x - (x - 4) = 28$

16. $7x = 0$

17. $2(x + 5) - 4(x - 5) = 0$

18. $x + 5 > 10$

19. $x - 7 > 8 - 2x$

20. $6 - x > 2$

21. $x^2 - 25 = 0$

22. $3x^2 + 3x - 18 = 0$

23. $x^2 + 15 = -8x$

24. $14x^2 - 7x = 0$

25. $(2x - 5)(x + 4) = 0$

Using exponents, perform indicated operations and simplify:

26. $x^7 \cdot x^6$

27. $x \cdot x^8$

28. x^0

29. $(x^2)^3$

30. $(2x)^4$

31. $(-2x)^3$

32. $(3x^2 y^2)^3$

33. $\frac{x^7}{x^2}$

34. $\frac{10x^3}{2x}$

35. $\frac{49x^5 y^4}{7xy^6}$

Solve each equation for y , then determine the slope and the y -intercept:

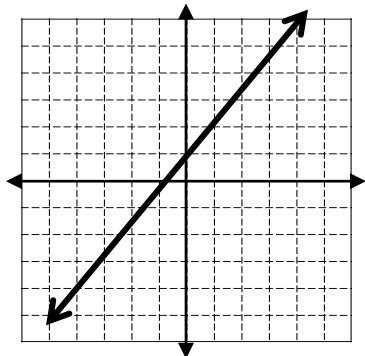
36. $2y = 2x - 4$

37. $7y = 14$

38. $3x - 5y = 15$

Find the slope and y -intercept of each:

39.



40. $y = 2x - 4$

41. Find the slope of the line contain the points $(-2, 4)$ and $(5, 3)$

42. Evaluate the expression $x^2 - 2x + 5$ when $x = -3$

B. Fill in each blank:

1. The origin is the point whose coordinates are _____.

2. The coefficient in $-7x^2$ is _____.

3. The exponent in $-7x^2$ is _____.

4. The base in $2(x + y)^2$ is _____.

5. A polynomial of one term is called a _____.

6. A polynomial of two terms is called a _____.

7. A polynomial of three terms is called a _____.

8. An example of a perfect square trinomial is _____.

9. An example of the difference of two squares is _____.

10. The solution of the equation $x + 2 = x + 3$ is _____.

11. If a system of equations graph as two parallel lines, the solution is _____.

12. If two equations in a system graph as the same line, the solutions are _____ and there are _____ solutions.
13. If two equations in a system graph to form two intersecting lines which intersect at the point $(1, -5)$, the solution is _____ and there is/are _____ solution(s).
14. The slope of a vertical line is _____.
15. The slope of a horizontal line is _____.
16. The radicand in $\sqrt{27}$ is _____.
17. The coefficient in $5\sqrt{21}$ is _____.

C. Practice with multiple choice questions:

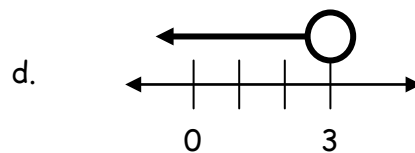
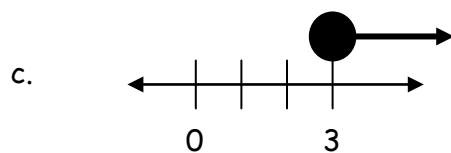
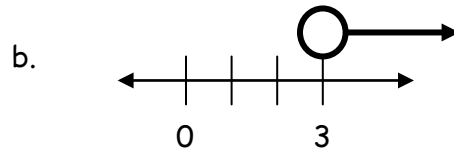
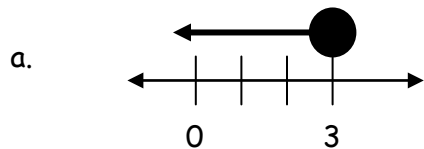
18. Solve: $3x^2 + 5x - 2 = 0$

a. $x = 1$ or $x = -2$

b. $x = -\frac{1}{3}$ or $x = -2$

c. $x = \frac{1}{3}$ or $x = -2$

19. Choose the correct graph of $7x - 3(x + 5) < -3$



20. Choose the system for which $(5, -1)$ is the solution:

a. $x = -1$
 $y = 5$

b. $x + 2y = 9$
 $y = -1$

c. $x - y = 6$
 $x + y = 4$

d. $2x + y = 9$
 $x - 3y = 5$

21. Multiply: $(7x^2)(-3x)$

a. $-10x$

b. $-21x^3$

c. $-21x^4$

d. $7^3(-3)x^3x$

22. Simplify: $(-2x^3)^2$

a. $4x^6$

b. $-2x^6$

c. $4x^5$

d. $-4x^6$

23. Multiply: $(2x - 3)(x + 7)$

a. $2x^2 - 21$

b. $13x - 21$

c. $2x^2 + 11x - 21$

d. $2x^2 - 11x + 21$

24. Factor completely: $16y - y^3$

a. $y(16 - y^2)$

b. $y(8 - y)(8 + y)$

c. $y(4 - y)(4 + y)$

25. Find the value of a^2bc^3 when $a = -1$, $b = 2$, $c = -3$

a. 54

b. -18

c. 18

d. -54

26. Find the value of $24 \div 8 \cdot 3$

a. 9

b. 1

c. $\frac{1}{9}$

d. 6

27. Use $A = \frac{1}{2}h(b + c)$ to find A when $h = 8$, $b = 7$, and $c = -3$

a. 20

b. 16

c. 40

d. $12\frac{1}{2}$

28. Solve: $x - 2(9 - x) = 3$

a. $x = -10\frac{1}{2}$

b. $x = 0$

c. $x = -13$

d. $x = 7$

29. The length of a rectangle is 12 meters more than its width. Its perimeter is 48 meters. Find the dimensions of the rectangle.

a. $L = 30\text{m}$ $w = 18\text{m}$

b. $L = 18\text{m}$ $w = 6\text{m}$

c. $L = 30\text{m}$ $w = 12\text{m}$

30. Give the slope of the line containing points $(-3, 2)$ and $(6, -5)$

a. -1

b. 1

c. $-\frac{7}{9}$

d. $-\frac{9}{7}$

D.

1. Write $4x \cdot 5y \cdot 3x \cdot x$ in exponential form.

2. Translate the following into an equation :

Three times the difference of a number x and 7 is 6

3. Find the sum of the matrices:

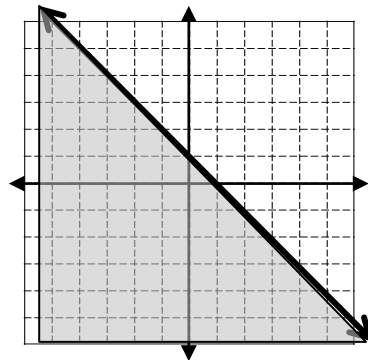
$$\begin{bmatrix} 5 & -4 \\ 7 & 2 \end{bmatrix} + \begin{bmatrix} -3 & 4 \\ 7 & -6 \end{bmatrix}$$

4. Find the difference of the matrices:

$$\begin{bmatrix} 5 & -4 \\ 7 & 2 \end{bmatrix} - \begin{bmatrix} -3 & 4 \\ 7 & -6 \end{bmatrix}$$

5. Graph the inequality: $-2 \leq x < 7$

6. Write the inequality for the half-planes graph:



7. Simplify: $(-3x^2y^3)(5xy^3)$

8. Simplify: $\left(\frac{5}{2}\right)^{-3}$

9. Simplify: $(-2x^3y^2)(3xy^3)^2$

Use the quadratic formula to solve each equation:

10. $x^2 + 4x = 5$

11. $3x^2 - 4x - 2 = 0$

12. $6x^2 + x - 2 = 0$

13. $x^2 + 6x + 4 = 0$

E.

Name the opposite and reciprocal of each:

1. 3

2. -7

3. $\frac{4}{5}$

4. $-\frac{6}{7}$

Evaluate for $x = 2$ and $x = -2$

5. $2x^2 - x$

6. $-3x^2$

7. $-x^2$

8. $\frac{1}{2}x - 2$

9. $(-x)^2$

Evaluate for $x = 7$ and $y = -3$

10. $(x + y)^2$

11. $x^2 + y^2$

12. $(x - y)^2$

13. $x^2 - y^2$

Write algebraic expressions for each.

14. The difference between a and m _____

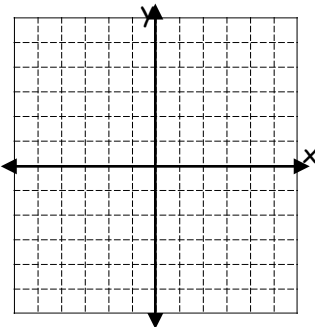
15. Seven less than a number, y _____

16. Eight more than five times a number c _____

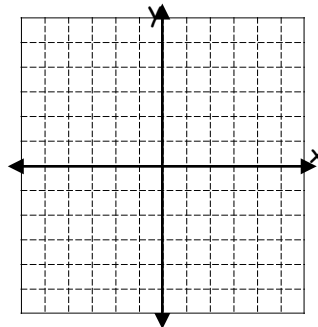
17. Twice the sum of a number, x , and nine _____

Graph the following equations.

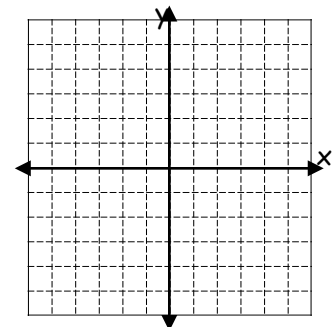
18. $y = 2x - 1$



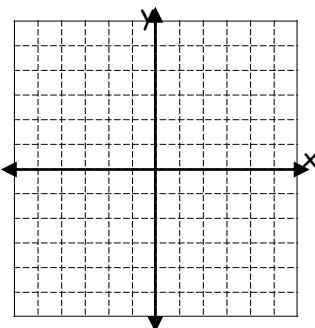
19. $y = -2$



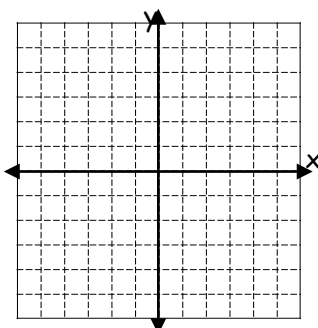
20. $x = 3$



21. $2x - 4y = 8$



22. $y = -\frac{2}{3}x + 2$



F.

Write the equation of each line.

1. Slope = 3, passing through (1, 2)

2. $m = -1$, passing through (1, 2)

3. $m = 4$, passing through (-2, 3)

Perform the indicated operations and simplify.

4. $3(x^2 + 2x - y) - 2(y - x + 3x^2)$

5. $(3x^2 + 2xy + 7) + (x^2 - 2x)$

6. $(ax - 2x + 6y) - (ax - 4x + 7y)$

7. $2xy^2(3x + 6xy - 7x^3y)$

8. $-2x(x^5 - 7x^2 + 1)$

9. $(x + 3)^2$

10. $(x - 2)(x + 2)$

11. $(5x - 9)(2x - 1)$

12. $(5x - 3y)^2$

13. $\frac{30x^4y^4}{6x^2y}$

Factor completely.

15. $6x^2 - 54$

16. $6x^2 + x - 1$

17. $3y^2 + 9y + 6$

18. $m^2 - 4m + 4$

19. $4y^2 - 13y + 9$

20. $x^2 - 3x - 28$

21. $3x^4 + 15xy - 27xy^3$

22. $64x^2 - 9y^2$

23. $x^2 - 17xy + 16y^2$

24. $5x^2 - 14x - 3$

G.

Solve each of the systems of linear equations.

1. $-4x + 2y = 2$
 $4x + 3y = -12$

2. $x - 2y = 16$
 $x + y = 10$

3. $3x + 2y = 11$
 $x = 3y$

4. $3x - 5y = 63$
 $2x + 3y = -15$

Rewrite in the following in decimal form.

5. $1,345 \times 10^2$

6. 3.9×10^{-3}

7. $(6 \times 10^{-2}) \cdot (3 \times 10^{-4})$

Rewrite the following in scientific notation form.

8. 2450

9. 0.000372

10. 1.78

11. 47.2

Simplify.

12. $|5 - 2|$

13. $|36|$

14. $|3 - 8|$

15. $|-53|$

H.

Simplify and leave in radical form.

1. $\sqrt{32}$

2. $-\sqrt{25} * \sqrt{9}$

3. $\frac{1}{2}\sqrt{160}$

4. $\sqrt{\frac{25}{49}}$

5. $\pm\sqrt{288}$

6. $\pm\sqrt{196}$

Identify whether the parabola opens up or down and find the vertex.

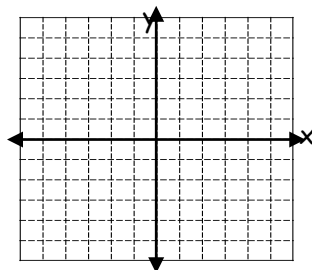
7. $y = -x^2$

8. $y = x^2 - 2x - 3$

9. $y = -x^2 + 2$

Graph.

10. $y = -x^2 + 2$



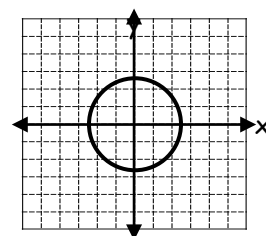
Determine whether the information defines a function.

11. $\{(3, 4), (5, 4), (7, 3), (2, 8)\}$

9.

12.

Input	-3	0	3	6
Output	1	3	1	2



Identify the domain and range of the function.

13. $\{(2, 4), (5, 4), (7, 3), (9, 8)\}$ Domain: _____

Range: _____

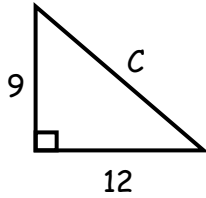
Evaluate the function.

14. $f(x) = 10x + 3$, at $f(0)$ and $f(2)$

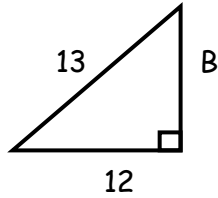
I.

Use the Pythagorean Theorem to find the missing length of a right triangle.

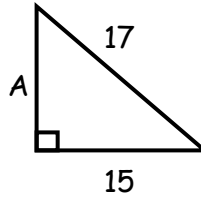
1.



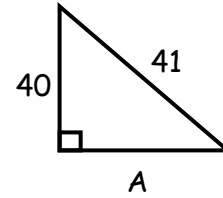
2.



3.



4.



Use the distance formula to find the distance between the two points.

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

6. (6, 9) and (14, 24)

7. (-5, 8) and (2, -16)

8. (-3, -5) and (-11, 5)

9. (5, 6) and (7, -10)

Find one of the many proofs of the Pythagorean Theorem. Write the solution, draw the solution and explain it in your own words.