Algebra 1 – Final Exam Review
Second Semester

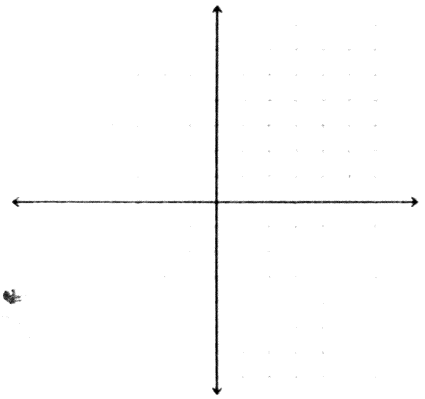
Name _____
Date _____ Hour _____

Chapter 7

For #1-3, graph each system of equations. Tell whether the system has no solution, one solution, or infinitely many solutions.

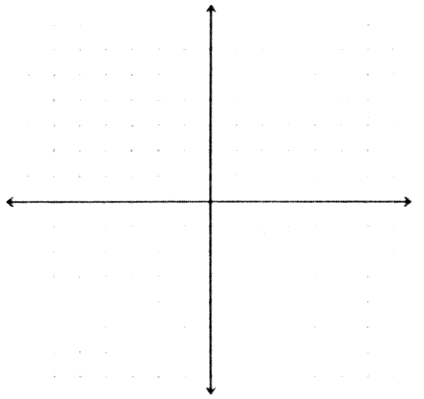
1) $y = 3x - 1$
$y = 3x + 4$

NO SOLUTION



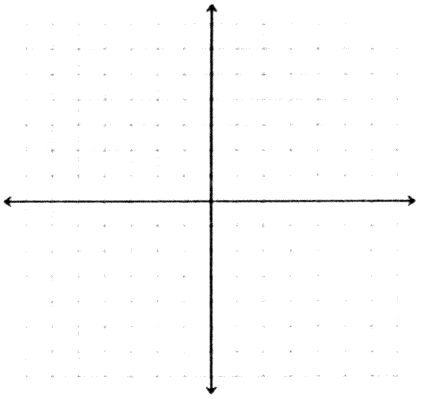
2) $y = 4x - 2$
$y = -2x + 2$

ONE SOLUTION



3) $x + 3y = 9$
$2x + y = 8$

ONE SOLUTION



4) The length of a rectangle is 2 in more than four times the width. If the perimeter of the rectangle is 64 in, what are its dimensions?

WIDTH: 6 inches
LENGTH: 26 inches

Solve each system of equations by substitution.

5) $y = x + 3$
$y = 3x + 1$ (1,4)

6) $x + 2y = -1$
$y = 3x - 11$ (3,-2)

7) $y = x - 7$
$2x + y = 8$ (5,-2)

Solve this system of equations by elimination.

8) $3x - 2y = -8$
$2x + 2y = -2$ (-2,1)

9) $3x + y = 20$
$x + y = 12$ (4,8)

10) $x + 8y = 28$
$-3x + 5y = 3$ (4,3)

Chapter 8

Simplify each expression.

1) 3^{-2} $\frac{1}{9}$

2) $\frac{7}{a^{-3}b^2}$ $\frac{7a^3}{b^2}$

3) $-4x^2 \cdot 5x^3$ $-20x^5$

4) $\frac{5x}{10x^3}$ $\frac{1}{x^2}$

5) $(2rs^4)^3(rs)^5$ $8r^8s^{17}$

6) $(3m^6)(m^2)(4k^0)$ $12m^8$

7) $(4b^3)^2$ $16b^6$

8) $\left(\frac{-3a^4b^{-3}c^2}{-2a^{-8}b^9c^{-3}}\right)^0$ 1

9) $\frac{-2x^5y^{-3}}{z^{-2}}$ $\frac{-2x^5z^2}{y^3}$

10) $-3d^{-4} \cdot 5d^9$ $-15d^5$

11) $\left(\ \ \right)^0$ 1

12) $(t^{-2})^6$ $\frac{1}{t^{12}}$

13) $\frac{x^8}{x^{-7}}$ x^{15}

14) $a(a^4b^{-2})^3$ $\frac{a^{13}}{b^6}$

15) $\frac{x^{14}}{x^7}$ x^7

16) $\frac{x^{15}}{x^{-4}}$ x^{19}

17) Evaluate $\frac{x^{-3}}{y^{-2}}$ if x = 3, y = -2 $\frac{4}{27}$

18) Evaluate $4x^2y^{-3}$ for x = -2 and y = 3 $\frac{16}{27}$

Chapter 9

Name _____

Date _____ Hour _____

Write each polynomial in standard form. Then name each polynomial by degree and number of terms. Use the table for your answers.

1. $2x^2 + x^3 - 5$ 2. $5y - 6y^3$ 3. $2 + 9x$ 4. $7j^6$

Standard Form	Degree	Monomial, Binomial, or Trinomial
1. x^3+2x^2-5	Cubic	Trinomial
2. $-6y^3+5y$	Cubic	Binomial
3. $9x+2$	Linear	Binomial
4. $7j^6$	Sixth	Monomial

Simplify each expression. Combine like terms. Remember to write your answer in standard form.

5) $(4x^2 - 5x) - (2x^2 - 3x + 3)$

$2x^2-2x-3$

6) $9 + 11x^2 + 3x + 5x^2$

$16x^2+3x+9$

7) $(n^4 + 2n - 1) + (5n - n^4 - 4)$

$7n-5$

8) $(6 - 3x^2) + (x^3 - x + 5)$

x^3-3x^2-x+11

9) $(-7x - 5x^3 + 5) - (-7x^3 - 5 - 9x)$

$2x^3+2x+10$

10) $(5x^2 - 10x + 3) + (6x^2 + 4x + 3)$

$11x^2-6x+6$

Simplify each expression.

11) $-2n(n^2 - 3n + 4)$

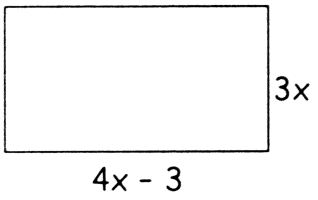
$-2n^3+6n^2-8n$

12) $5k^2(3k^2 + 4k - 2)$

$15k^4+20k^3-10k^2$

Chapter 9 continued

13) Write an expression for the perimeter of the figure below.



$14x-6$

14) Factor the polynomial $6x^3 + 3x^2 + 9x$. (Divide out the G.C.F.)

$3x(2x^2+x+3)$

Simplify. Use distributive property, FOIL, or the box method.

15) $(4x + 3)(2x + 1)$

$8x^2+10x+3$

16) $(4h - 5)(5h - 6)$

$20h^2-49h+30$

17) $(3x - 7)(3x + 3)$

$9x^2-12x-21$

18) $(3x + 4)^2$

$9x^2+24x+16$

19) $(3m^2 - 4)(3m^2 + 4)$

$9m^4-16$

20) $(2n^2 + 4)(3n + 2)$

$6n^3+4n^2+12n+8$

Factor each expression. Use the X or X-box method. Check for G.C.F. first!

21) $d^2 + 14d + 13$

$(x+1)(x+13)$

22) $x^2 - 12x + 36$

$(x-6)(x-6)$ or $(x-6)^2$

23) $2x^2 - 2x - 112$

$2(x-8)(x+7)$

24) $12d^2 + 4d - 1$

$(2x+1)(6x-1)$

25) $3x^2 - 21x + 30$

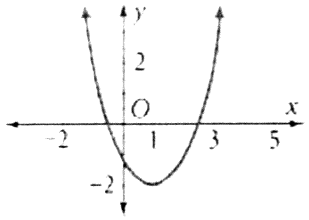
$3(x-2)(x-5)$

26) $r^2 - 144$

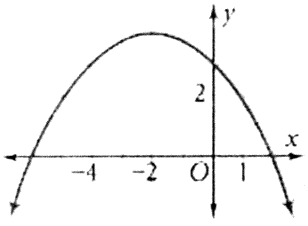
$(x+12)(x-12)$

Chapter 10

1. Identify the vertex of each graph and tell whether it is a minimum or a maximum.

a. 

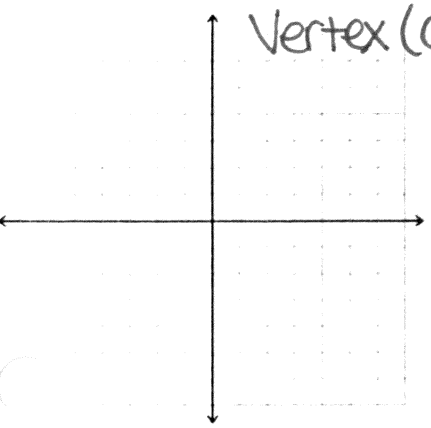
(1,-2)
MIN

b. 

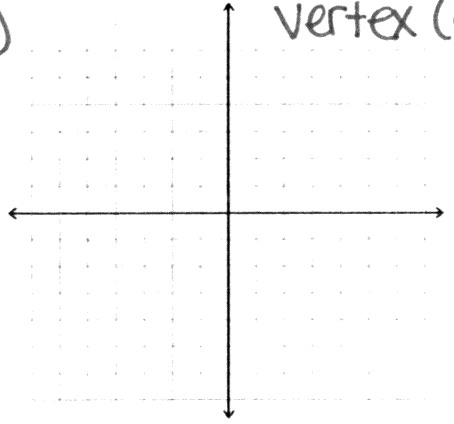
(-2,4)
MAX

Graph each equation. **Label the vertex and the axis of symmetry.**

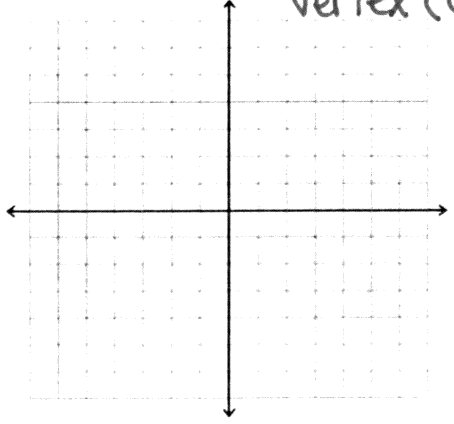
2) $y = x^2$ AOS X=0 Vertex (0,0)



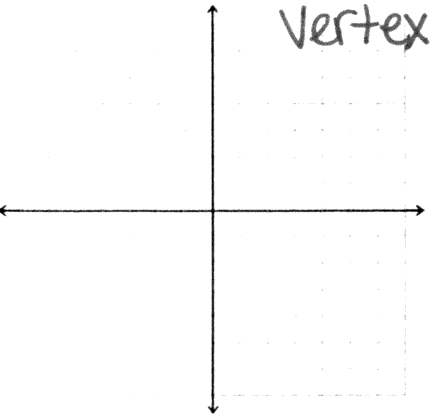
3) $y = -x^2$ AOS X=0 Vertex (0,0)



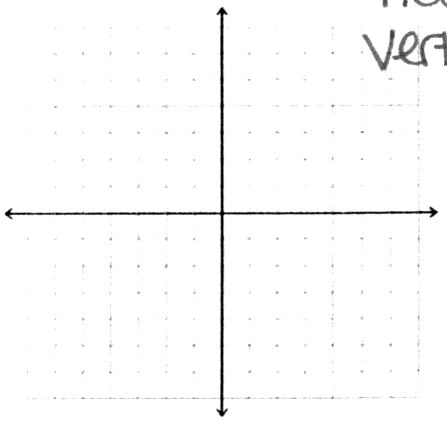
4) $y = \frac{1}{2}x^2$ AOS X=0 Vertex (0,0



5) $y = x^2 + 4$ AOS X=0 Vertex (0,4)



6) $y = -2x^2 - 4x + 1$ AOS X= -1 Vertex (-1,3)



7) Find the equation of the axis of symmetry and the coordinates of the vertex of the graph of the function $y = 2x^2 + 8x - 1$. AOS X= -2 Vertex (-2,-9)

8) A ball is thrown into the air with an upward velocity of 48 ft/s. Its height h in feet after t seconds is given by the function $h = -16t^2 + 48t + 4$.

   a. In how many seconds does the ball reach its maximum height? Round to the nearest hundredth if necessary. 1.5 seconds

   b. What is the ball's maximum height? 40 feet

9) Order the group of quadratic functions from widest to narrowest.

$y = -4x^2$ $\quad y = -\frac{1}{2}x^2$ $\quad y = \frac{3}{4}x^2$

$y = -1/2x^2$, $y = 3/4x^2$, $y = -4x^2$

Solve each quadratic equation using square roots.

10) $k^2 = 16$

$k = \pm 4$

11) $4x^2 + 6 = 10$

$x = \pm 1$

12) $x^2 + 15 = 9$

NO SOLUTION

Solve each quadratic equation using the Zero-Product Property.

13) $(x - 5)(x + 3) = 0$

$x = 5$ or $x = -3$

14) $(2x + 3)(4x - 5) = 0$

$x = -3/2$ or $x = 5/4$

Solve each quadratic equation by factoring. (Check for a G.C.F. first.)

15) $z^2 + 6z - 27 = 0$

$x = -9$ or $x = 3$

16) $3x^2 + 3x - 6 = 0$

$x = 1$ or $x = -2$

17) $c^2 - 3c = 0$

$x = 3$ or $x = 0$

Solve each quadratic equation using the quadratic formula.

18) $-x^2 - 12x = 20$

$x = 2$ or $x = 10$

19) $x^2 - 6x = 7$

$x = 7$ or $x = -1$

20) $2x^2 - 7x - 13 = 0$

$x = 4.84$

or

$x = -1.34$