Algebra I Midterm Review   Name: _____

1. Simplify the expression:
$$6(x + 1) - 8x(x - 2) + 10$$

2. Simplify the expression:
$$-2(2x + 7) - 3$$

3. Simplify the expression.
$$3(x - 1) + 5(3x - 4)$$

4. Simplify the expression:
$$-2(2x - 3) + 3x$$

5. Solve for m.
$$mx + 4y = 3t$$

6. Solve for r.
$$S = 2\pi rh$$

7. Solve for y.
$$Ax + by = C$$

8. Solve for h.
$$V = \pi r^2 h$$

9. Write as an algebraic expression:
Five times the sum of the cube of y and the square of x

10. Write as an algebraic expression:
Twice the difference of x and y decreased by 3

11. Write as an algebraic expression:
Add 5 to the product of x and y, then divide by 8

12. Write as an algebraic expression:
Add 6 to n then multiply your answer by 4

13. Name the terms, coefficients, constants, and factors

Expression	$-3x^5 + 2x^3 - 5x - 1$			
Terms				
Factors				
Coefficients				
Constants				

14. Name the terms, coefficients, constants, and factors

Expression	$9x^2 + 7x - 4$			
Terms				
Factors				
Coefficients				
Constants				

15. Simplify and show work:
$(6x^2 - x - 4) + (2x^2 + 5x - 5)$

16. Simplify and show work:
$(2x^2 - 3x + 7) - (5x^2 + 3x + 6)$

17. Simplify and show work:
$(x + 4)(x + 11)$

18. Simplify and show work:
$(x + 5)^2$

19. Simplify the expression
$11\sqrt{7} - 4\sqrt{7}$

20. Simplify the expression
$\sqrt{72} + \sqrt{2}$

21. Simplify the expression
$\sqrt{45}$

22. Simplify the expression
$\sqrt{8} \cdot \sqrt{2}$

23. A rectangle has a length of $(x + 4)$ and a width of $(x - 1)$. Find the area of the rectangle.

24. A rectangle has a length of $(2x + 5)$ and a width of $(3x + 2)$. Find the perimeter of the rectangle.

25. Multiply the following binomials.
$$(x + 3)(x - 7)$$

26. Multiply the following binomials.
$$(x - 3)^2$$

27. Simplify:
$$\sqrt{5} + 4\sqrt{5} + 3\sqrt{7}$$

28. Simplify:
$$\sqrt{3} + 18\sqrt{11} - 7\sqrt{11}$$

29. Simplify:
$$\frac{\sqrt{32}}{\sqrt{2}}$$

30. Simplify:
$$2(\sqrt{5} - \sqrt{2}) + 3(\sqrt{2} - \sqrt{5})$$

31. Rational or Irrational? Why?
$$\pi$$

32. Rational or Irrational? Why?
$$\sqrt{9}$$

33. Complete the conjecture that describes the given expression.
$$\sqrt{5} + 2$$

The sum of a (rational, irrational) number and a (rational, irrational) I number is (rational, irrational) .

34. Complete the conjecture that describes the given expression.
$$\sqrt{3}(\sqrt{11})$$

The product of a (rational, irrational) number and a (rational, irrational) number is (rational, irrational).

Unit 2 Linear Equations and Inequalities

1. Solve by Substitution:

$$y = x - 2$$

$$3x + y = 8$$

2. Solve by Substitution:

$$4x - y = -6$$

$$y = 2x + 2$$

3. Solve by Elimination:

$$5x - 3y = 7$$
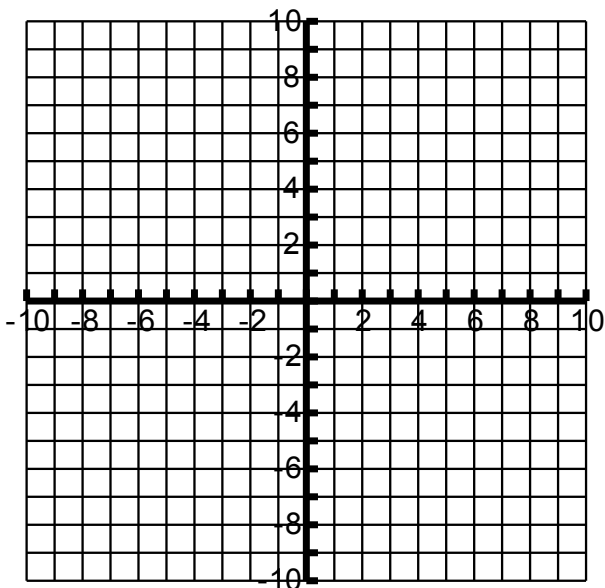
$$x + 3y = 5$$

4. Solve by Elimination:

$$4x + 3y = 19$$

$$3x - 3y = 9$$

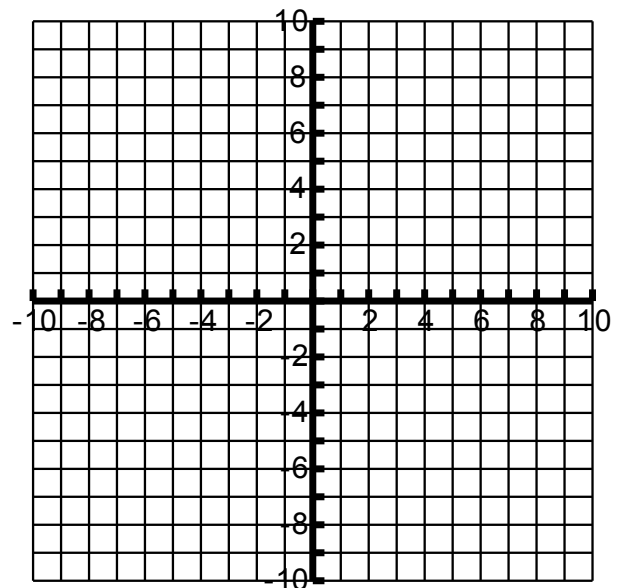5. Solve by Graphing:

$$y = -x + 3$$

$$y = x + 1$$

6. Solve by Graphing:

$$y = -2x + 7$$

$$-3x + 6y = 12$$

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7. Write an equation: Alyssa needs $5.00 to buy some ice cream. The only money she has is a jar of dimes and quarters.	8. Write an equation: Bill wants to buy some CDs at the music store. Used ones sell for $4.99, and new ones sell for $13.99. He has $75 to spend that he got for his birthday.
9. Write an Inequality: Sarah is selling bracelets and earrings to make money for summer vacation. The bracelets cost $2 each and earrings cost $4 each. She needs to make at least $500.	10. Write an Equation: A store sold 32 pairs of jeans for a total of $1050. Brand A sold for $30 per pair and Brand B sold for $35 per pair.
11. Is the ordered pair $(5,9)$ a solution to the following linear system? $$x + y = 14$$ $$-x + 2y = 11$$	12. What are the solutions of the following linear systems? $$y = -x + 7$$ $$-2x + 2y = 6$$
13. Solve the literal equation for h. $$V = \pi r^2 h$$	14. Solve the literal equation for y. $$6w - y = 2z$$
15. Solve and graph: $6x + 12 > 3x - 18$	16. Solve and Graph: $-2x + 5 \geq -3x - 9$

17. Graph: y < 3x + 1
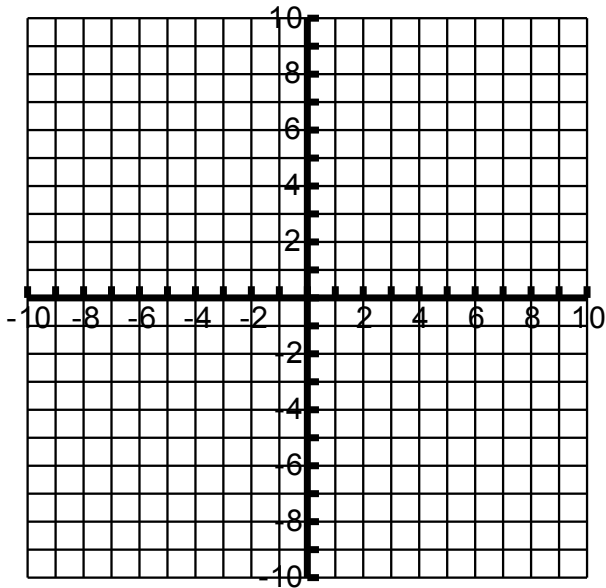
18. x + 2y > 4
    2x − y ≥ 6
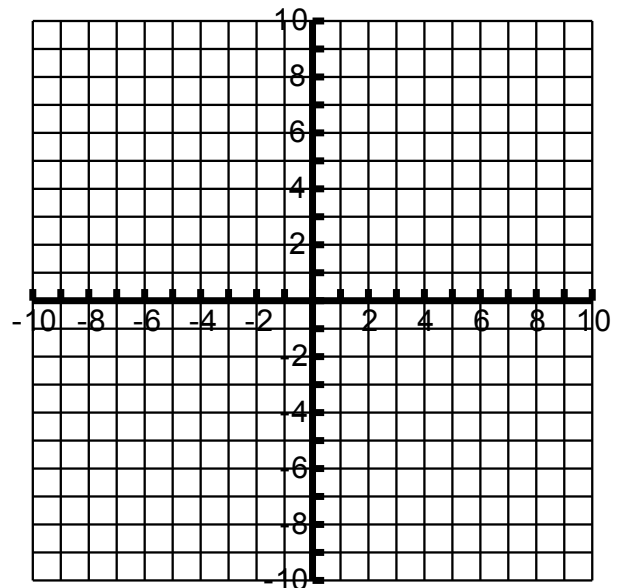
19. Find the rate of change:
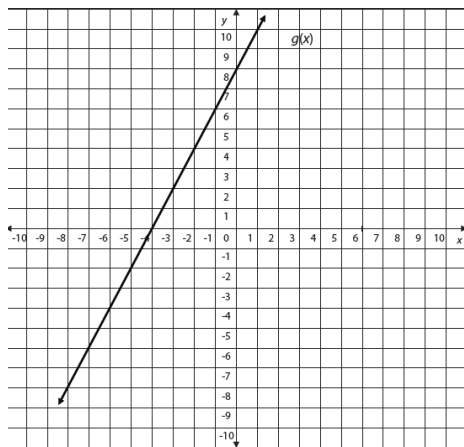
20. Find the rate of change:
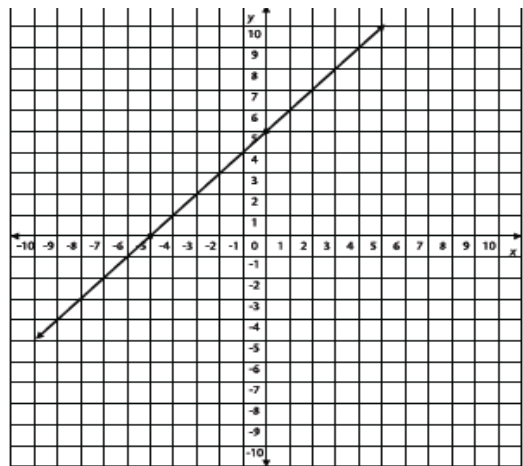
21. Find the rate of change:

x	$f(x)$
−2	1
0	7
2	13
4	19

22. If the domain of $f(x) = x + 2$ is

{0, 3, 6}, what is the range of f(x)?

Unit 3 Quadratics

1. Factor:

$$x^2 + 6x + 5$$

2. Factor:

$$2x^2 + x - 3$$

3. Solve by factoring:

$$x^2 - 9x + 20 = 0$$

4. Solve by factoring:

$$x^2 - 16 = 0$$

5. Solve by factoring:

$$6x^2 + 7x = -2$$

6. Solve by factoring:

$$2x^2 - 10x - 28 = 0$$

7. Solve by using square roots:

$$3x^2 = 28$$

8. Solve by using square roots:

$$(x + 8)^2 = 16$$

9. Solve by completing the square:

$$2x^2 - 8x - 10 = 0$$

10. Solve by completing the square:

$$3x^2 + 12x - 9 = 0$$

11. Solve by completing the square:

$$x^2 - 5x - 2 = 0$$

12. Solve by completing the square:

$$x^2 - 6x + 5 = 0$$

13. Solve by using the quadratic formula:

$$3x^2 - 2 = -x$$

14. Solve by using the quadratic formula:

$$x^2 - 9 = 0$$

15. Solve by sing the quadratic formula:

$$-7x^2 - 5x = -1$$

16. Solve by using the quadratic formula:

$$x^2 - 4x - 12 = 0$$