

SHOW ALL WORK. Identify final answers clearly.

Class period _____

PART 1: Linear Equations and Inequalities**1 – 10: Solve the equation**

1. $2(x-5)=14$

6. $\frac{x+1}{5} = \frac{4x}{15}$

2. $4.2x+6.4=40$

7. $\frac{8+x}{2} = 10$

3. $(3x+2)-2(x+4)=7$

8. $\frac{3}{y+2} = \frac{2}{y}$

4. $\frac{2}{3}x+5=21$

9. $x+2x+(2x+15)=180$

5. $\frac{2}{3} = \frac{x}{18}$

10. $104 = \frac{1}{2}[(360-x)-x]$

11 – 13: Solve the inequalities

11. $8(x-3) \geq 96$

12. $3-x < -2$

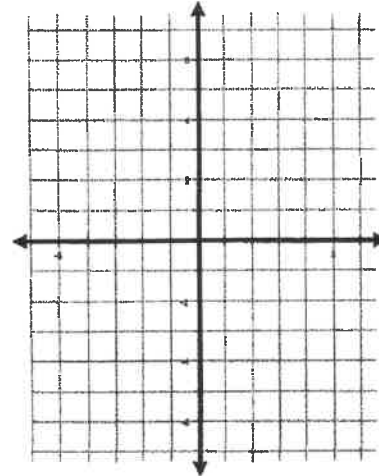
13. $2-10x \geq 22$

15 – 16: Plot and label the points. Draw the line that passes between them. Calculate the slope using the slope formula.

The slope of the line between $A(x_1, y_1)$ and

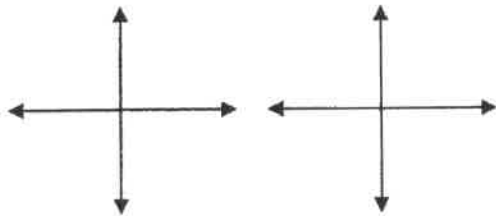
$B(x_2, y_2)$ is: $m = \frac{y_2 - y_1}{x_2 - x_1}$

15. $A(0,3)$ and $B(6,1)$



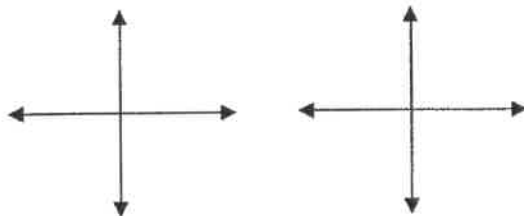
PART 2: Graphing Linear Equations

14. Sketch a line with the appropriate slope.



Positive

Negative

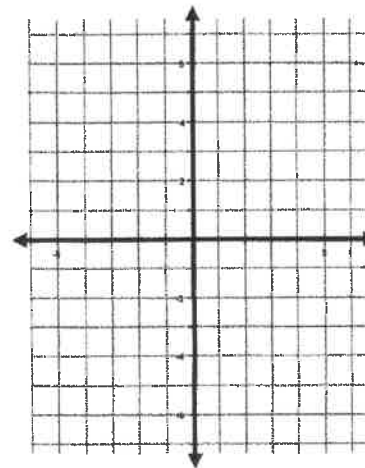


Zero

Undefined

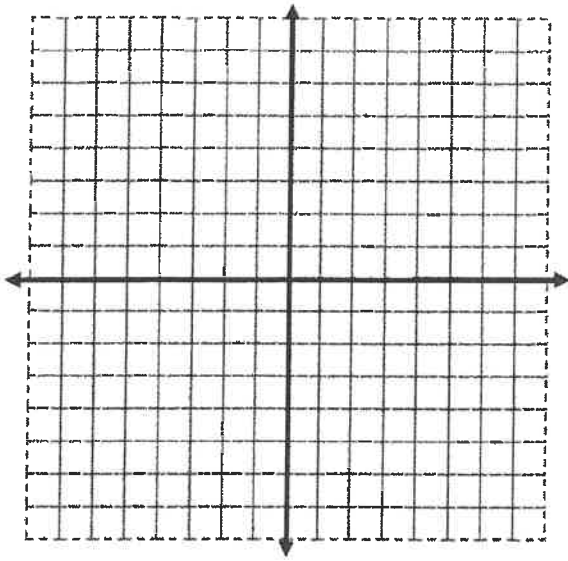
16. $A(3, 2)$ and $B(-1, -6)$; draw \overleftrightarrow{AB} .
 $C(-4, -2)$ $D(-5, -4)$; draw \overleftrightarrow{CD}

Calculate the slopes and explain if the lines are parallel or not.

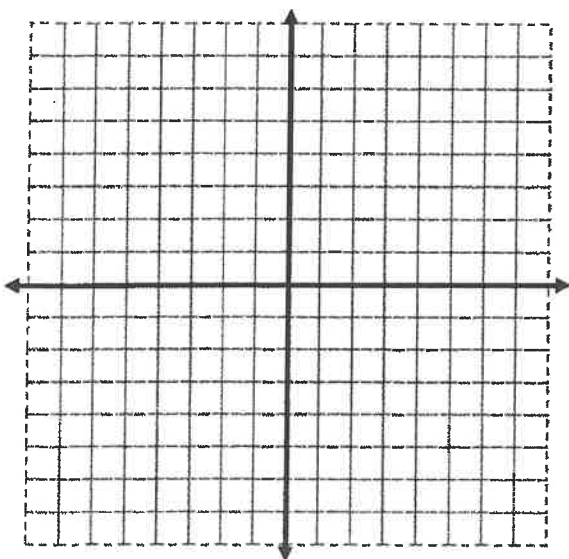


17 – 19: Rewrite each equation in slope-intercept form, $y = mx + b$. Identify the slope, m , and the y -intercept, b . Then graph.

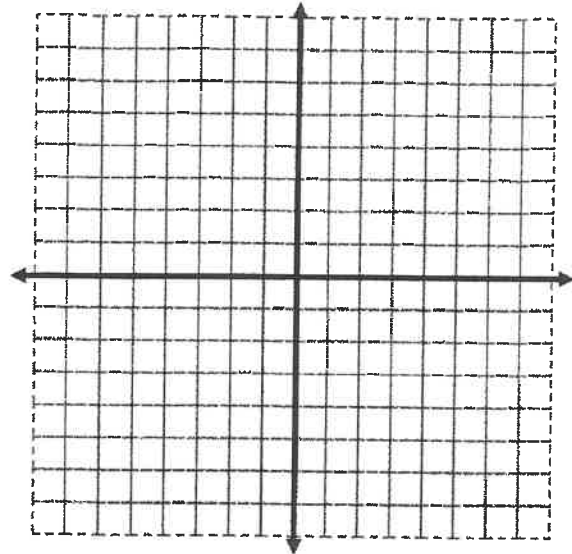
17. $x + y = 6$



18. $4x + 2y = 8$

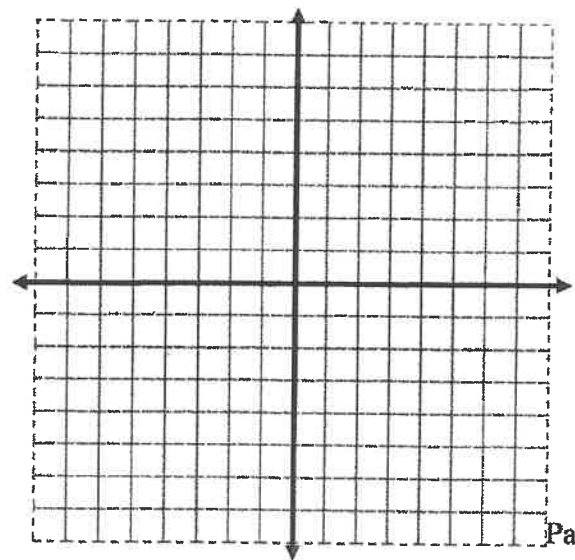


19. $2x - 6y = 12$



20. Graph both equations. Identify the point of intersection

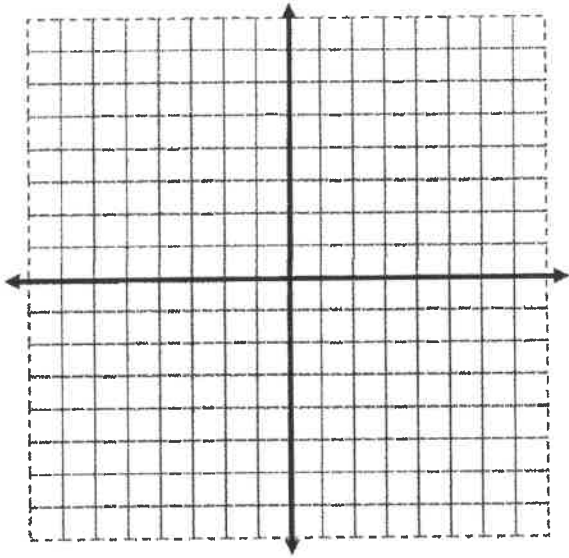
$4x + 2y = 14$ $-4x + 3y = -9$



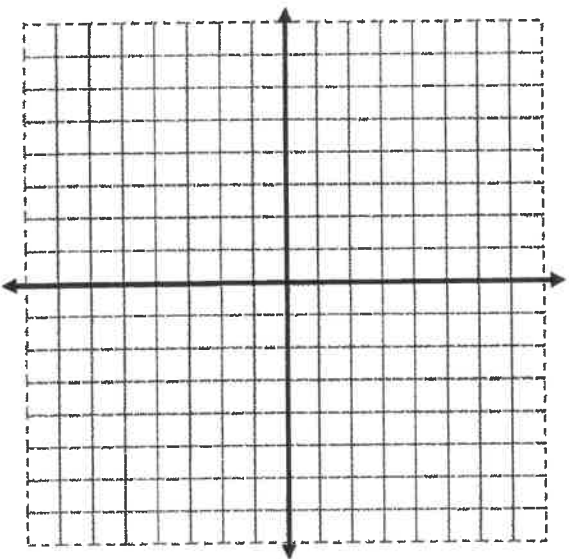
21 – 22: Find the x and y intercepts of the equation. Plot the intercepts and graph the line.

Remember: to find the x intercept, let $y = 0$
to find the y intercept, let $x = 0$

21. $6x - 3y = 12$



22. $25x + 10y = 50$



23 – 29: Write the equation of the line in slope-intercept form using the given information

Follow these steps:

1: identify the slope (if necessary- use the slope formula)

2: identify the y intercept (if necessary- substitute the slope and the coordinates of one of the points into $y = mx + b$. solve for b)

3: use the results of the first two steps to write the equation

23. slope = $\frac{3}{4}$; y intercept is $(0, -5)$

24. slope = -3 ; passes through $(4, -3)$

25. slope = $\frac{2}{3}$; passes through $(-3, 5)$

26. passes through $(2, -3)$ and $(5, -9)$

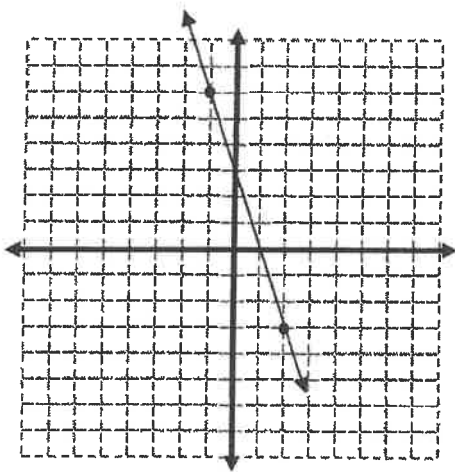
27. passes through $(-5, 3)$ and $(7, 9)$

PART 3: Linear Systems

30 – 35: Solve each system of equations using the method of your choice (substitution or combination)

30. $x + y = 12$
 $x - y = 2$

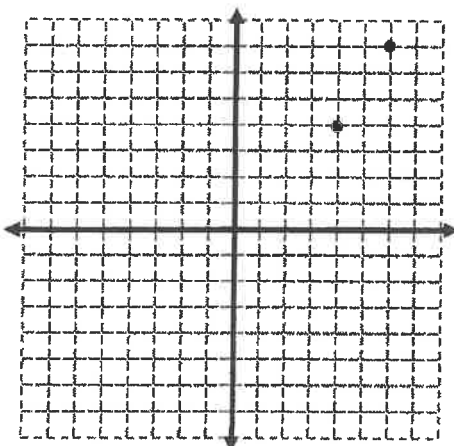
28. Write the equation of the line in the graph



31. $2x + y = 5$
 $2x = 14$

29. Sketch the line that passes through the two points. Write the equation of the line.

32. $4x + 3y = 13$
 $y = -x + 4$



33. $4x + 2y = 4$
 $6x + 2y = 8$

34. $\frac{1}{3}x + y = \frac{5}{3}$
 $5x - y = 1$

35. $2x - 3y = 6$
 $6x - 9y = 9$

PART 4: Quadratic Equations, Polynomials, and Radicals

36 – 39: Simplify the expressions by using the distributive property

36. $(x+11)^2$

37. $(3x-4)^2$

38. $5x(2x-4y+9)$

39. $-3x(x^2+2x-7)$

40 – 41: Solve the equation by taking the square root of both sides (there are two solutions!)

40. $2x^2 = 50$

41. $5^2 + b^2 = 13^2$

42 – 45: Solve by factoring

Example:

$$x^2 + 5x = -6 \text{ original equation}$$

$$x^2 + 5x + 6 = 0 \text{ put in standard form}$$

$$(x+3)(x+2) = 0 \text{ factor}$$

$$x+3=0 \text{ or } x+2=0 \text{ zero product property}$$

$$x = -3 \text{ or } x = -2 \text{ two solutions}$$

42. $x^2 + 6x + 8 = 0$

43. $x^2 + 5x + 6 = -x^2 - 3x$

44. $3x^2 + 7x - 8 = -10$

45. $2x^2 - 4x + 2 = 0$

46 -47: Solve by using the quadratic formula:

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

(Use a calculator to estimate answers to the nearest hundredth)

46. $x^2 - 3x + 1 = 0$

47. $5x^2 + 2x - 2 = 0$

48 – 51: Simplify the radical expression
(Do not estimate with a calculator)

Example:

$$\sqrt{24} = \sqrt{4} \cdot \sqrt{6} = 2\sqrt{6}$$

48. $\sqrt{32}$

49. $2\sqrt{75}$

50. $(4\sqrt{3})^2$

51. $(5\sqrt{6})(3\sqrt{3})$

52 – 53: Simplify by rationalizing the denominator

Example:

$$\frac{15}{\sqrt{5}} = \frac{15}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \frac{15\sqrt{5}}{5} = 3\sqrt{5}$$

52. $\frac{15}{\sqrt{3}}$

53. $\frac{40}{\sqrt{2}}$

PART 5: Geometry and Applications

54. Given triangle ABC: $m\angle A = 65^\circ$,
 $m\angle B = n^\circ$, $m\angle C = (4n)^\circ$. Find the measure of
each angle. (Remember, the sum of the three
angles of a triangle equals 180°)

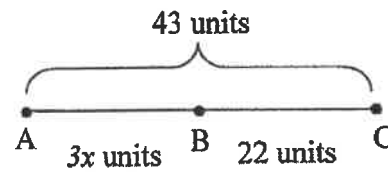
Equation: _____ + _____ + _____ = _____

$$m\angle A = 65^\circ$$

$$m\angle B = \underline{\hspace{2cm}}$$

$$m\angle C = \underline{\hspace{2cm}}$$

55. The length of line segment AC is 43 units.
Segment AB is $3x$ and segment BC is 22. What is
the length of segment AB? What is the value of
 x ?

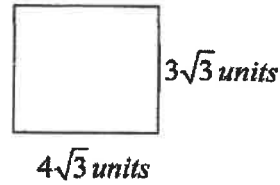


56 – 59: Sketch the given figure and label its
dimensions. Find the area and perimeter.

56. A rectangle with length 3.6 cm and
width 4.2 cm

57. A square with a side length of 9 mm.

62. Find the area of the rectangle



58. Find the circumference and area of a circle with a radius of 4 in. (use 3.14 for pi and round answers to the nearest tenth of a unit)

63. **Answer in complete sentences where appropriate. Show all your work to receive full credit.**

Square Deal Pizza offers square pizza that is 15 inches long on each side. A cheese pizza costs \$9.00.

Roundoff Pizza offers circular pizza that is 16 inches in diameter. A cheese pizza at Roundoff costs \$8.75.

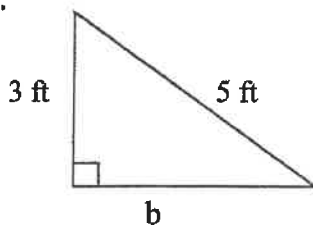
- Which restaurant's pizza is bigger? Justify your answer using words, symbols, or both.

- Which restaurant's pizza is a better buy? Justify your answer using words, symbols, or both.

59. Find the area of a triangle with base length of 10 cm and a height of 8 cm.

60 – 61: Use the Pythagorean theorem ($c^2 = a^2 + b^2$) to find the missing side length in the triangle.

60.



61.

