Summer Math Packet to Prepare for Plane Geometry and Plane Geometry/Trigonometry

SHOW ALL WORK. Identify final answers clearly.

PART 1: Linear Equations and Inequalities

1 – 10: Solve the equation

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

2. $4.2x+6.4=40$

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

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

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

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

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

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

9 – 11: Solve the inequalities

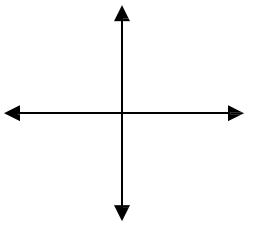
9. $8(x-3) \geq 96$

10. $3 - x < -2$

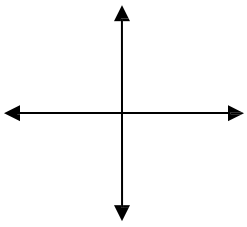
11. $2 - 10x \geq 22$

PART 2: Graphing Linear Equations

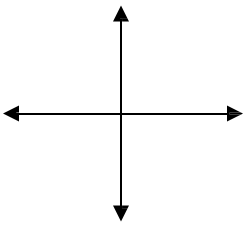
12. Sketch a line with the appropriate slope.



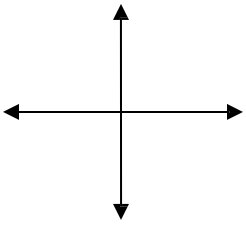
Positive



Negative



Zero

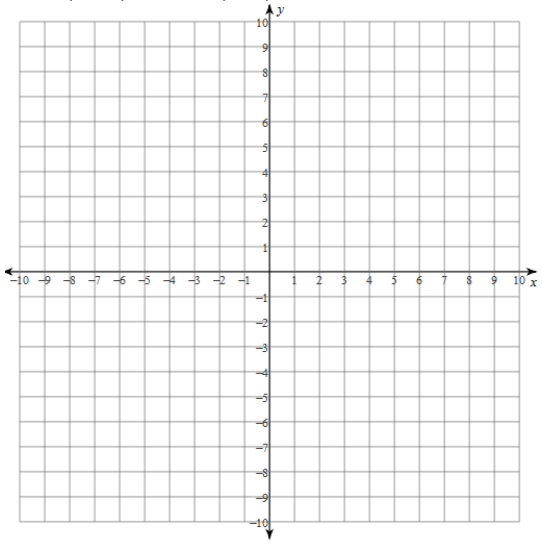


Undefined

13 – 14: Plot and label the points. Draw the line that passes between them. Calculate the slope using the slope formula.

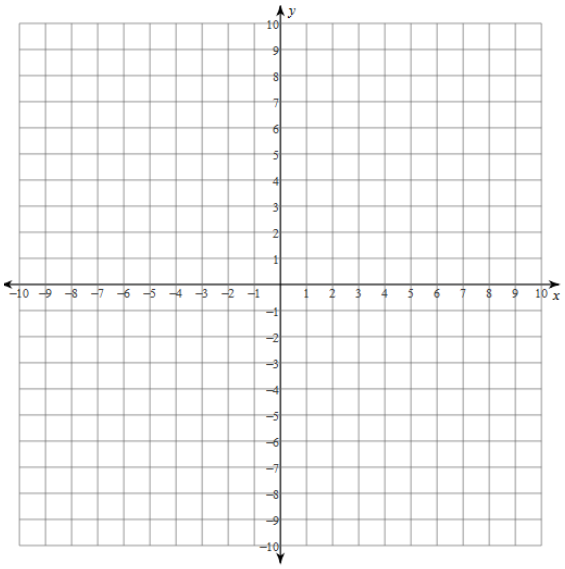
The slope of the line between $A(x_1, y_1)$ and $B(x_2, y_2)$ is: $m = \dfrac{y_2 - y_1}{x_2 - x_1}$

13. A(0,3) and B(6,1)



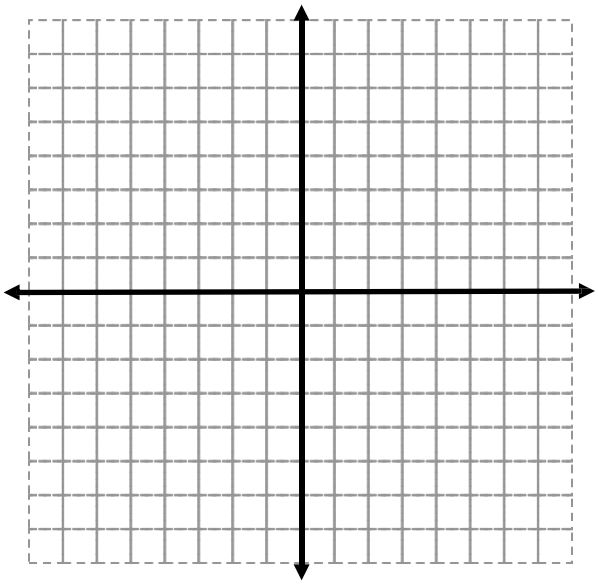
14. A(3, 2) and B(–1, –6) ; draw $\overleftrightarrow{AB}$.
C(–4, –2) D(–5, –4) ; draw $\overleftrightarrow{CD}$

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

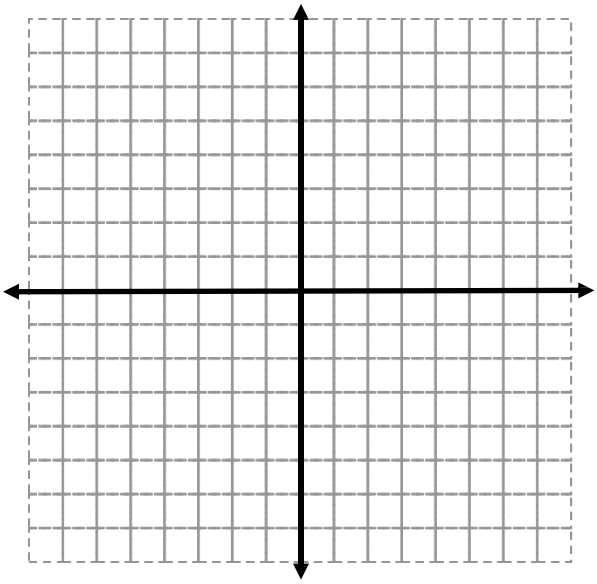


15 – 16: Rewrite each equation in slope-intercept form, y = mx + b. Identify the slope, m, and the y-intercept, b. Then graph.

15. $x + y = 6$

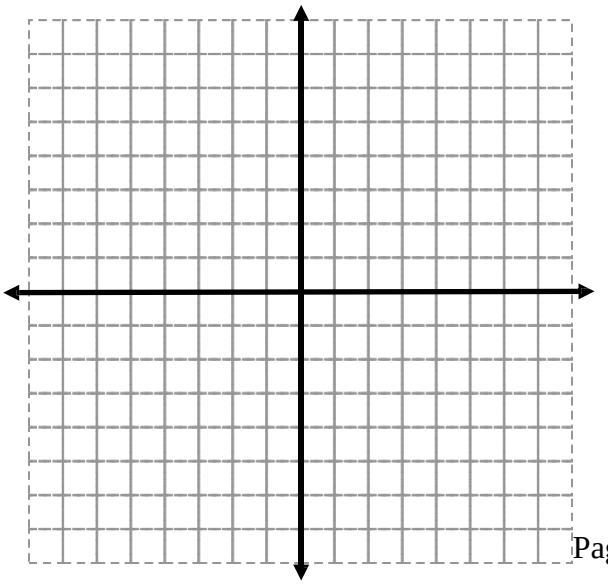


16. $2x - 6y = 12$



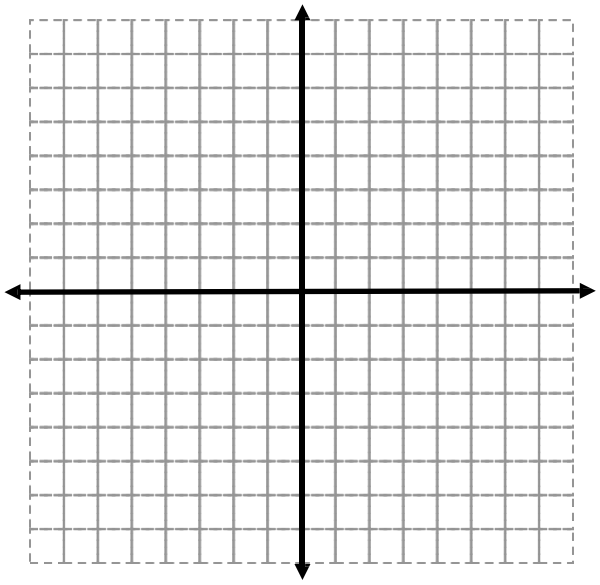
17. Graph both equations. Identify the point of intersection

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



18: 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

18. $6x - 3y = 12$



19 – 23: 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

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

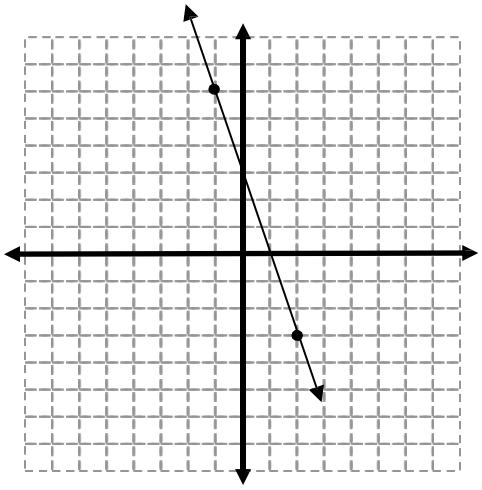
20. slope = -3; passes through (4, –3)

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

22. passes through (2, –3) and (5, –9)

23. passes through (–5, 3) and (7, 9)

24. Write the equation of the line in the graph



PART 3: Linear Systems

25 – 27: Solve each system of equations using the method of your choice (substitution or elimination)

25. $\begin{aligned} x + y &= 12 \\ x - y &= 2 \end{aligned}$

26. $\begin{aligned} 2x + y &= 5 \\ 2x &= 14 \end{aligned}$

27. $\begin{aligned} 4x + 3y &= 13 \\ y &= -x + 4 \end{aligned}$

PART 4: Quadratic Equations, Polynomials, and Radicals

28 – 31: Simplify the expressions.

28. $(x+11)^2$

29. $(3x-4)^2$

30. $5x(2x-4y+9)$

31. $-3x(x^2+2x-7)$

32 – 33: Solve the equation by taking the square root of both sides (there are two solutions!)

32. $2x^2=50$

33. $5^2+b^2=13^2$

34 – 37: Solve by factoring
Example:
$x^2+5x=-6$ original equation
$x^2+5x+6=0$ put in standard form
$(x+3)(x+2)=0$ factor
$x+3=0$ *or* $x+2=0$ zero product property
$x=-3$ *or* $x=-2$ two solutions

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

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

36. $3x^2+7x-8=-10$

37. $2x^2-4x+2=0$

38 -39: Solve by using the quadratic formula:

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

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

39. $5x^2 + 2x - 2 = 0$

40 – 43: Simplify the radical expression
(Do <u>not</u> estimate with a calculator)
Example: $\sqrt{24} = \sqrt{4} \times \sqrt{6} = 2\sqrt{6}$

40. $\sqrt{32}$

41. $2\sqrt{75}$

42. $(4\sqrt{3})^2$

43. $(5\sqrt{6})(3\sqrt{3})$

44 – 53: Simplify by rationalizing the denominator
Example:

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

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

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

46. Find the area and Perimeter of a square with a side length of 9 mm.

47. Find the area of the rectangle