Find the unknown coordinate so the line through the points has the given slope.

1. $(5, y), (2, 2)$; slope = 3

2. $(-1, 1), (5, y)$; slope = $\dfrac{1}{2}$

3. $(x, 7), (4, -3)$; slope = -1

Tell whether the intersection of $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$ forms a right angle.

4. $A(-8, 3), B(1, 2), C(0, 9), D(-1, 0)$

5. $A(-8, 17), B(-5, 18), C(6, 11), D(5, 8)$

Write an equation of the line that passes through point *P* and is parallel to the line with the given equation.

6. $P\left(\dfrac{5}{2}, 4\right); y = 4x + 1$

7. $P\left(1, -\dfrac{2}{3}\right); y = \dfrac{1}{3}x - 7$

8. $P\left(\dfrac{5}{3}, \dfrac{11}{4}\right); y = -\dfrac{6}{5}x + 4$

Write an equation of the line that passes through point P and is parallel to the line with the given points.

9. $P(3,-3)$ through $(1,-2)$ and $(3,6)$

10. $P(6,-1)$ through $\left(0,\dfrac{3}{4}\right)$ and $\left(2,\dfrac{27}{4}\right)$

11. $P(-4,6)$ through $(-3,3)$ and $(2,-7)$

Write an equation of the line that passes through point _P_ and is perpendicular to the line with the given equation.

12. $P(1,-7);\ y=\dfrac{1}{2}x-5$

13. $P\left(-2,\dfrac{7}{2}\right);\ y=-\dfrac{1}{4}x+7$

14. $P\left(-\dfrac{3}{4},\dfrac{16}{3}\right);\ y=\dfrac{9}{2}x+1$

Write an equation of the line that passes through point P and is perpendicular to the line with the given points.

15. $P(-4,-4)$ through $(-2,5)$ and $(1,-1)$

16. $P(2,-3)$ through $(-1,-1)$ and $(1,-9)$

17. $P(5,4)$ through $(-4,5)$ and $(2,2)$

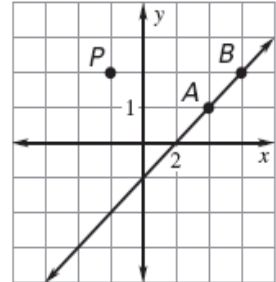**Graph the line parallel to line *AB* that passes through point *P* and write its equation.**
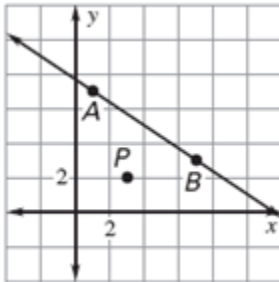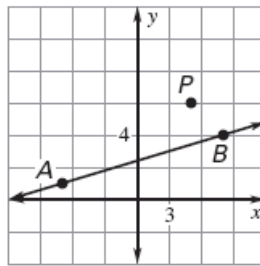
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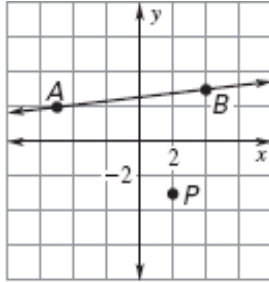
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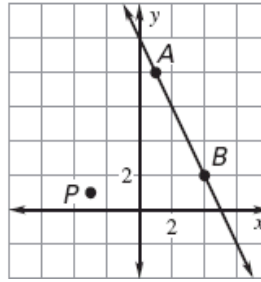
20.

Graph the line perpendicular to line *AB* that passes through point *P* and write its equation.
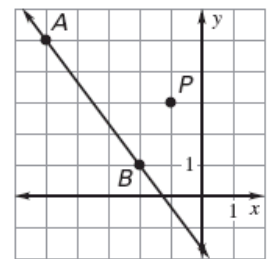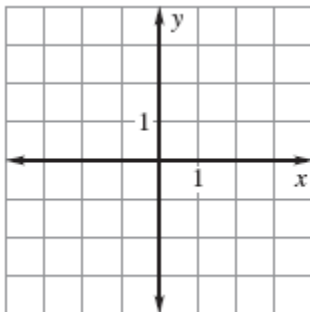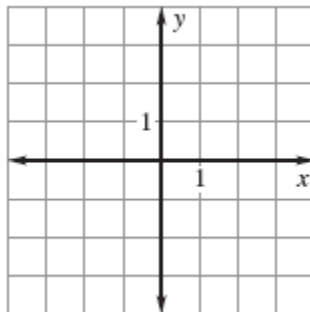
21.

22.

23.

Graph the equation. It may be helpful to either put the equation in slope-intercept form or to graph using x- and y-intercepts.
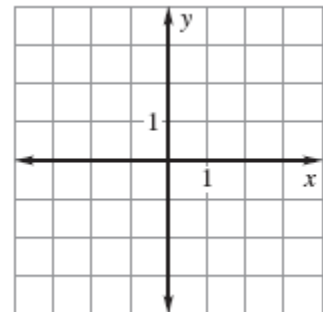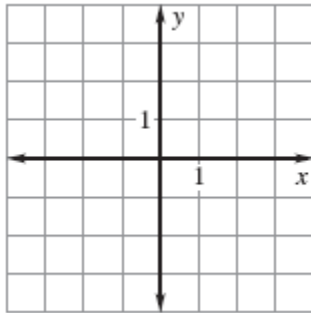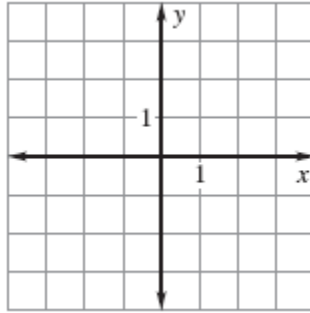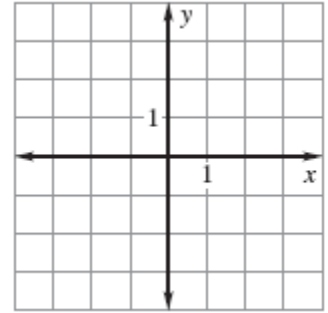
24. $2x + 4y = 3$

25. $x + 3y = 4x - 2$

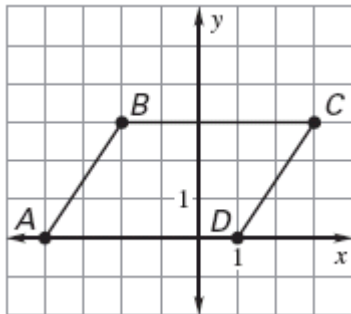26. $x - 2y = y + 5$

27. $4(x-2)+2=2y-4$

28. $3(y-4)=7x-15$

29. $2(y+1)=3x+5(y+2)$

30. Parallelograms A parallelogram is a four-sided figure whose opposite sides are parallel. *Explain* in words and algebraically why the figure shown is a parallelogram.

Answer Key:

1. (5, 11)   2. (5, 4)   3. (-6, 7)   4. Yes   5. No

6. $y = 4x - 6$ 7. $y = \dfrac{1}{3}x - 1$ 8. $y = -\dfrac{6}{5}x + \dfrac{19}{4}$ 9. $y = 4x - 15$

10. $y = 3x - 19$ 11. $y = -2x - 2$ 12. $y = -2x - 5$ 13. $y = 4x + \dfrac{23}{2}$

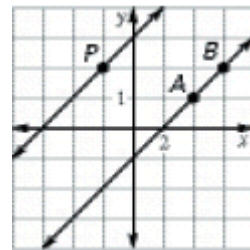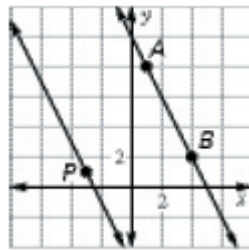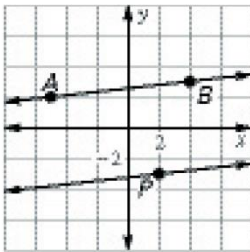14. $y = -\dfrac{2}{9}x + \dfrac{31}{6}$ 15. $y = \dfrac{1}{2}x - 2$ 16. $y = \dfrac{1}{4}x - \dfrac{7}{2}$ 17. $y = 2x - 6$
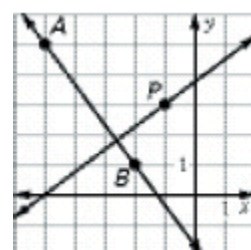
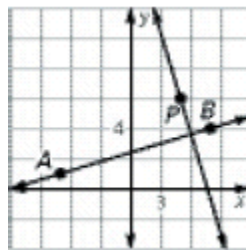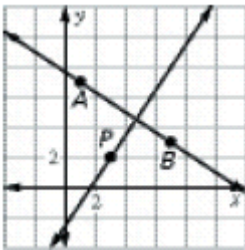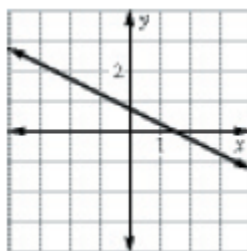18. $y = \dfrac{1}{9}x - \dfrac{29}{9}$ 19. $y = -2x - 5$ 20. $y = \dfrac{1}{2}x + 3$
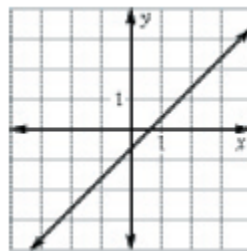
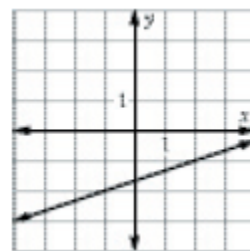21. $y = \dfrac{3}{2}x - \dfrac{5}{2}$ 22. $y = -\dfrac{15}{3}x + 31$ 23. $y = \dfrac{3}{4}x + \dfrac{15}{4}$

24.   25.   26.

27.
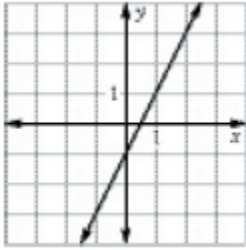
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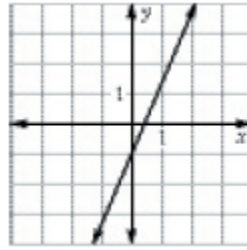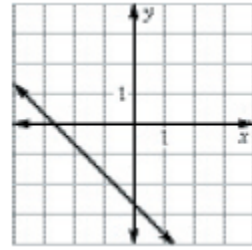

29.

30. $m_{\overrightarrow{AB}} = \dfrac{3}{2}, m_{\overrightarrow{CD}} = \dfrac{3}{2}, m_{\overrightarrow{BC}} = 0, m_{\overrightarrow{AD}} = 0$; The opposite sides of the figure are parallel because they have the same slope.