

Writing Linear Equations - parallel & perpendicular

Write the standard form of the equation of each line.

1) $-\frac{4}{3}x = -y - 4$

$$-3\left(-\frac{4}{3}x + y = -4\right) \quad \boxed{4x - 3y = 12}$$

2) $-5x = -4y$

$$-1(-5x + 4y = 0)$$

$$\boxed{5x - 4y = 0}$$

3) $5 - 5y = -3x$

$$-1(-3x + 5y = 5)$$

$$\boxed{3x - 5y = -5}$$

4) $y = \frac{1}{2}x$

$$-2\left(-\frac{1}{2}x + y = 0\right)$$

$$\boxed{x - 2y = 0}$$

Write the point-slope form of the equation of the line through the given point with the given slope.

5) through: $(-3, -1)$, slope = -1

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

6) through: $(-2, 3)$, slope = 2

$$y - 3 = 2(x + 2)$$

7) through: $(3, 1)$, slope = 3

$$y - 1 = 3(x - 3)$$

8) through: $(-1, 0)$, slope = -3

$$y - 0 = -3(x + 1)$$

Write the point-slope form of the equation of the line through the given points.

9) through: $(0, -2)$ and $(-3, -3)$

$$\frac{-2 + 3}{0 + 3} = \frac{1}{3}$$

$$\boxed{y + 2 = \frac{1}{3}(x - 0)}$$

$$\boxed{y + 3 = \frac{1}{3}(x + 3)}$$

10) through: $(-2, 5)$ and $(3, -1)$

$$\frac{5 + 1}{-2 - 3} = \frac{6}{-5}$$

$$\boxed{y - 5 = -\frac{6}{5}(x + 2)}$$

$$\boxed{y + 1 = -\frac{6}{5}(x - 3)}$$

11) through: $(-2, -4)$ and $(1, 1)$

$$\frac{-4 - 1}{-2 - 1} = \frac{-5}{-3} = \frac{5}{3}$$

$$\boxed{y + 4 = \frac{5}{3}(x + 2)}$$

$$\boxed{y - 1 = \frac{5}{3}(x - 1)}$$

12) through: $(-1, 5)$ and $(4, -2)$

$$\frac{5 + 2}{-1 - 4} = \frac{7}{-5} = -\frac{7}{5}$$

$$\boxed{y - 5 = -\frac{7}{5}(x + 1)}$$

$$\boxed{y + 2 = -\frac{7}{5}(x - 4)}$$

13) through: $(-1, -5)$ and $(0, -4)$

$$\frac{-5 + 4}{-1 - 0} = \frac{-1}{-1} = 1$$

$$\boxed{y + 5 = 1(x + 1)}$$

$$\boxed{y + 4 = 1(x - 0)}$$

14) through: $(-4, 2)$ and $(-2, 3)$

$$\frac{2 - 3}{-4 + 2} = \frac{-1}{-2} = \frac{1}{2}$$

$$\boxed{y - 2 = \frac{1}{2}(x + 4)}$$

$$\boxed{y - 3 = \frac{1}{2}(x + 2)}$$

15) through: $(3, 0)$ and $(-2, 1)$

$$\frac{0 - 1}{3 + 2} = -\frac{1}{5}$$

$$\boxed{y - 0 = -\frac{1}{5}(x - 3)}$$

$$\boxed{y - 1 = -\frac{1}{5}(x + 2)}$$

16) through: $(3, -5)$ and $(0, 0)$

$$\frac{-5 - 0}{3 - 0} = -\frac{5}{3}$$

$$\boxed{y + 5 = -\frac{5}{3}(x - 3)}$$

$$\boxed{y - 0 = -\frac{5}{3}(x - 0)}$$

Write the slope-intercept form of the equation of the line described.

17) through: $(5, -5)$, parallel to $y = -\frac{1}{5}x + 2$

$$y + 5 = -\frac{1}{5}(x - 5)$$

$$y + 5 = -\frac{1}{5}x + 1 \quad y = -\frac{1}{5}x - 4$$

$$x = -2$$

19) through: $(0, -2)$, perp. to $y = \frac{4}{3}x - 5$

$$y + 2 = -\frac{3}{4}(x - 0)$$

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

20) through: $(-1, -1)$, perp. to $y = \frac{1}{4}x + 1$

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

$$y + 1 = -4x - 4 \quad y = -4x - 5$$

21) through: $(-2, 5)$, parallel to $y = -5x + 2$

$$y - 5 = -5(x + 2)$$

$$y - 5 = -5x - 10 \quad y = -5x - 5$$

22) through: $(-1, -2)$, parallel to $y = -\frac{3}{2}x + 4$

$$y + 2 = -\frac{3}{2}(x + 1)$$

$$y + 2 = -\frac{3}{2}x - \frac{3}{2} \quad y = -\frac{3}{2}x - \frac{7}{2}$$

23) through: $(3, 3)$, perp. to $y = -x + 1$

$$y - 3 = 1(x - 3)$$

$$y - 3 = x - 3 \quad y = x$$

24) through: $(5, 0)$, perp. to $y = -\frac{5}{3}x$

$$y - 0 = \frac{3}{5}(x - 5)$$

$$y = \frac{3}{5}x - 3$$

25) through: $(0, 3)$, parallel to $y = 3x + 1$

$$y - 3 = 3(x - 0)$$

$$y - 3 = 3x \quad y = 3x + 3$$

26) through: $(2, -4)$, parallel to $y = -\frac{3}{2}x + 3$

$$y + 4 = -\frac{3}{2}(x - 2)$$

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

27) through: $(-1, -3)$, perp. to $y = -\frac{1}{4}x + 2$

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

$$y + 3 = 4x + 4 \quad y = 4x + 1$$

$$x = -1$$

29) through: $(-3, -3)$, parallel to $y = -\frac{5}{2}x + 1$

$$y + 3 = -\frac{5}{2}(x + 3)$$

$$y + 3 = -\frac{5}{2}x - \frac{15}{2} \quad y = -\frac{5}{2}x - \frac{21}{2}$$

30) through: $(5, 4)$, parallel to $y = \frac{9}{5}x + 2$

$$y - 4 = \frac{9}{5}(x - 5)$$

$$y - 4 = \frac{9}{5}x - 9 \quad y = \frac{9}{5}x - 5$$

31) through: $(-4, -1)$, perp. to $y = -x + 2$

$$y + 1 = 1(x + 4)$$

$$y + 1 = x + 4 \quad y = x + 3$$

32) through: $(-2, -2)$, perp. to $y = \frac{2}{3}x$

$$y + 2 = -\frac{3}{2}(x + 2)$$

$$y + 2 = -\frac{3}{2}x - 3 \quad y = -\frac{3}{2}x - 5$$