

Welcome! please grab your ISN and warmup and have a seat!

Write in point-slope form the equation of the line that is parallel to the given line and passes through the given point. Your final answer should be in slope-intercept form.

1. $y = x + 5, (-1, -1)$

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

$y = x + 5$
 $m = 1$
 $y + 1 = 1(x + 1)$
 $y + 1 = x + 1$
 $y = x$

Use point-slope form to write an equation in slope-intercept form of the line that is perpendicular to the given line and passes through the given point.

2. $y = 3x - 1, (1, -3)$

$y + 3 = -\frac{1}{3}(x - 1)$
 $3y + 9 = -1x + 1$
 $3y = -1x - 8$
 $y = -\frac{1}{3}x - \frac{8}{3}$

Sep 21-8:05 AM

1. Determine the slope of the line passing through $(-3, 5)$ and $(0, -1)$.

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-1 - 5}{0 - (-3)} = \frac{-6}{3} = -2$

1-0
2-8
3-0
4-0
5-1

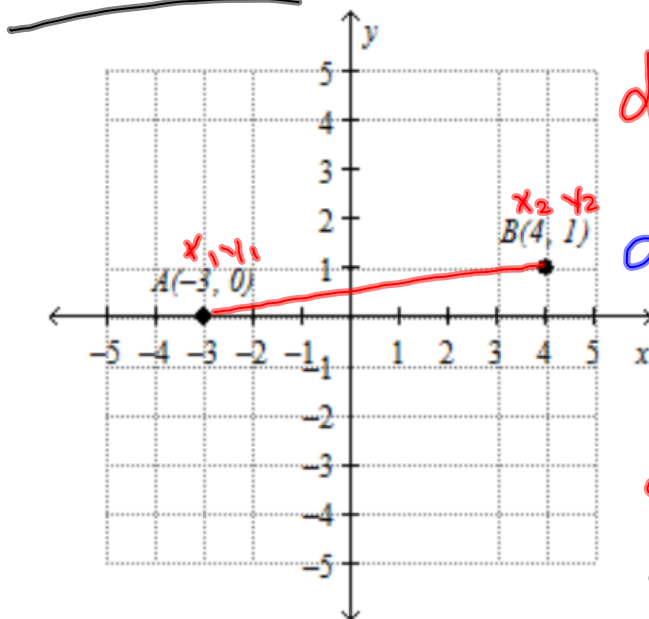
6-2
7-0
8-7
9-1
10-1

11-1
12-2
13-2
14-3
15-1

16-1
17-1
18-0
19-0
20-1

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2. What is the length of \overline{AB} ? Round to the nearest hundredth. distance!



$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$d = \sqrt{(4 - (-3))^2 + (1 - 0)^2}$$

$$d = \sqrt{(7)^2 + (1)^2}$$

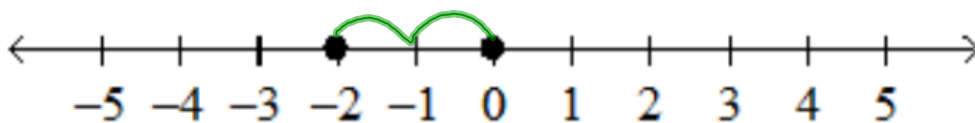
$$d = \sqrt{49 + 1}$$

$$d = \sqrt{50} = 5\sqrt{2}$$

$$\boxed{7.07} \checkmark$$

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3. Find the distance between the points on the number line.



$$\boxed{2}$$

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4. Determine the midpoint of the line segment with endpoints $(7, -1)$ and $(-4, 4)$.

$$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$M = \left(\frac{7 + (-4)}{2}, \frac{-1 + 4}{2} \right)$$

$$M = \left(\frac{3}{2}, \frac{3}{2} \right)$$

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5. Determine the midpoint of the line segment connecting $(9, 0)$ and $(8, -7)$.

$$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$M = \left(\frac{9 + 8}{2}, \frac{0 + (-7)}{2} \right)$$

$$M = \left(\frac{17}{2}, -\frac{7}{2} \right)$$

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6. Write the equation of the line that has slope $-\frac{1}{2}$ and passes through $(-5, -2)$.

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

$$2y + 4 = -x - 5$$

$$2y = -x - 9$$

$$y = -\frac{1}{2}x - \frac{9}{2}$$

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7. Find a line that is perpendicular to $y = -\frac{1}{4}x$ and passes through point $(6, 32)$.

$$m = -\frac{1}{4} \rightarrow \frac{+4}{1} = \boxed{4}$$

$$y - y_1 = m(x - x_1)$$

$$y - 32 = 4(x - 6)$$

$$\begin{array}{r} y - 32 = 4x - 24 \\ \downarrow + 32 \quad \downarrow + 32 \\ \hline \boxed{y = 4x + 8} \end{array}$$

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8. Are the lines $y = \frac{9}{4}x - 6$ and $y = 1 + \frac{9}{4}x$ parallel, perpendicular, or neither?

$$y = \boxed{\frac{9}{4}}x - 6 \quad y = 1 + \boxed{\frac{9}{4}}x$$

→ same Slope ←

Parallel!

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9. Find a line that is parallel to $y = 4x - 2$ and passes through the point $(0, 2)$.

$$m = \boxed{4}$$

$$y - y_1 = m(x - x_1)$$

$$y - 2 = 4(x - 0)$$

$$y - 2 = 4x - 0$$

$$\downarrow +2 \quad \downarrow +2$$

$$\boxed{y = 4x + 2}$$

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10. Are the lines $y = x + 3$ and $y = -5 + x$ parallel, perpendicular, or neither?

$$\begin{array}{cc} y = \overset{\uparrow}{x} + 3 & y = -5 + \overset{\uparrow}{x} \\ m = 1 & m = 1 \end{array}$$

↪ same slope ↪

Parallel!

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11. Find a line that is parallel to $y = \boxed{-4}x - 6$ and passes through point $(-1, 6)$.

$$\begin{aligned} m &= -4 \\ y - y_1 &= m(x - x_1) \\ y - 6 &= -4(x + 1) \\ y - 6 &= -4x - 4 \\ \downarrow +6 & \quad \downarrow +6 \\ \hline y &= -4x + 2 \end{aligned}$$

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12. Find the distance between the points $(-5, 2)$ and $(1, -1)$.
 x_2 y_2
 x_1 y_1

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$d = \sqrt{(-5 - 1)^2 + (2 - (-1))^2}$$

$$d = \sqrt{(-6)^2 + (3)^2}$$

$$d = \sqrt{36 + 9} = \sqrt{45}$$

$$d = 3\sqrt{5}$$

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13. Write an equation in slope-intercept form for the line perpendicular to $y = 4x - 4$ that passes through the point $(-6, -4)$.
 x_1 y_1

$$m = \frac{4}{1} \rightarrow \left[-\frac{1}{4}\right]$$

$$y - y_1 = m(x - x_1)$$

$$y + 4 = -\frac{1}{4}(x + 6)$$

$$\begin{array}{r} 4y + 16 = -1x - 6 \\ \hline 4y = -1x - 22 \\ \frac{4y}{4} = \frac{-1x - 22}{4} \end{array}$$

$$y = -\frac{1}{4}x - \frac{11}{2}$$

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14. Which line is parallel to $y = \boxed{-2}x + 9$?

a. $y = \boxed{\frac{1}{2}}x$

d. $y = \boxed{1}x + 9$

b. $2y = -2x \quad y = \boxed{-1}x$

e. None correct

c. $2y + 4x = \cancel{0}$
 $\quad \quad \quad -4x \quad | \quad -4x$

$\frac{2y}{2} = \frac{-4x}{2}$

$y = \boxed{-2}x$

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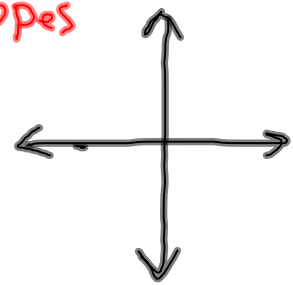
15. The equations of four lines are given. Identify the perpendicular lines. *opp. rec. slopes*

Line 1: $y = -1 \Rightarrow y = 0x - 1 \quad m = 0$

Line 2: $y = \boxed{-\frac{1}{5}}x + 1 \quad m = -\frac{1}{5}$

Line 3: $x = 5$ undefined

Line 4: $y - 4 = \boxed{5}(x - 1)$
 $y - 4 = m(x - x_1)$

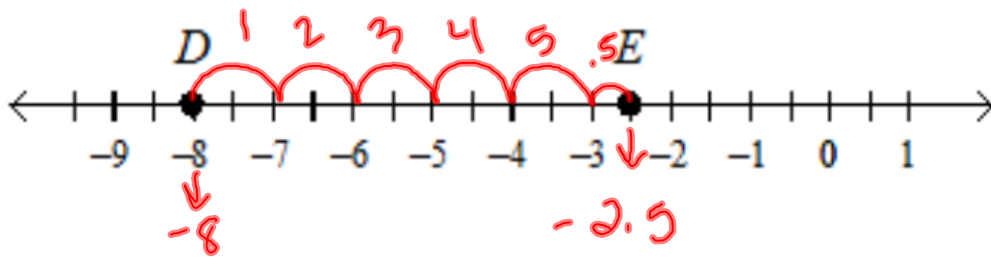


1 \perp 3

2 \perp 4

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16. Find the length of \overline{DE} .



$$-2.5 - -8 = -2.5 + 8 = \boxed{5.5}$$

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17. What is the equation of a line that has slope $\frac{2}{3}$ and passes through $(6, -4)$?

$$y - y_1 = m(x - x_1)$$

$$y - (-4) = \frac{2}{3}(x - 6)$$

$$\begin{array}{r} 3y + 12 = 2x - 12 \\ \underline{-12} \quad \underline{\downarrow -12} \end{array}$$

$$\frac{3y}{3} = \frac{2x - 24}{3}$$

$$\boxed{y = \frac{2}{3}x - 8}$$

Sep 21-8:10 AM

18. Determine the slope of the line containing points $(7, 3)$ and $(-3, 0)$.

$$m = \left(\frac{y_2 - y_1}{x_2 - x_1} \right)$$

$$m = \frac{0 - 3}{-3 - 7} = \frac{-3}{-10} = \boxed{\frac{3}{10}}$$

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19. Write the equation $-2x - y = 1$ in slope-intercept form, and then find the slope and y-intercept.

$$\begin{array}{r|l} -2x - y = 1 & +2x \\ \hline +2x & 2x + 1 \\ -y & -1 \\ \hline -y & -1 \end{array}$$

$$y = \boxed{-2}x \boxed{-1}$$

↑ slope
← y-intercept

$$y = mx + b$$

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20. The equations of four lines are given. Identify the parallel lines.. *same slope*

Line 1: $y = \boxed{-6}x + 9$

Line 2: $y + 7 = \boxed{-\frac{4}{3}}(x + 8)$

Line 3: $y = \boxed{-\frac{3}{4}}x - 8$

Line 4: $x + \frac{1}{6}y = -7 \rightarrow$

$$\begin{array}{r}
 x + \frac{1}{6}y = -7 \\
 \underline{-x} \qquad \qquad \qquad \downarrow \\
 \frac{1}{6}y = -7 \\
 \frac{6}{6}y = \frac{-42}{6} \\
 y = \boxed{-6}x - 42
 \end{array}$$

1 3 4

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Sep 21-9:43 AM