

# Pick any 4 problems!

Kuta Software - Infinite Algebra 1

Name \_\_\_\_\_

## Finding Slope From Two Points

Date \_\_\_\_\_ Period \_\_\_\_\_

Find the slope of the line through each pair of points.

$$1) (19, -16), (-7, -15)$$

$$\frac{-16 - (-15)}{19 - (-7)} = \frac{-16 + 15}{19 + 7} = \frac{-1}{24}$$

$$m = -\frac{1}{24} \quad \perp m = 24$$

$$3) (-4, 7), (-6, -4)$$

$$m = \frac{11}{2} \quad \perp m = -\frac{2}{11}$$

$$5) (17, -13), (17, 8)$$

$$\frac{-13 - 8}{17 - 17} = \frac{-21}{0}$$

$$\frac{N}{D} = \frac{0}{K}$$

$$m = \text{undefined}$$

$$\perp m = 0$$

$$7) (3, 0), (-11, -15)$$

$$m = \frac{15}{14} \quad \perp m = -\frac{14}{15}$$

$$m = \frac{y_1 - y_2}{x_1 - x_2}$$

$\perp m = \text{negative reciprocal (flip/reverse)}$

Missy Elliott

≠ then the perpendicular slope!

$$2) (1, -19), (-2, -7)$$

$$m = -4$$

$$\perp m = \frac{1}{4}$$

$$4) (20, 8), (9, 16)$$

$$\frac{8 - 16}{20 - 9} = \frac{-8}{11}$$

$$m = -\frac{8}{11} \quad \perp m = \frac{11}{8}$$

$$6) (19, 3), (20, 3)$$

$$\frac{3 - 3}{19 - 20} = \frac{0}{-1}$$

$$m = 0 \quad \perp m = \text{undefined}$$

$$8) (19, -2), (-11, 10)$$

$$m = -\frac{2}{5} \quad \perp m = \frac{5}{2}$$

13) through:  $(2, -4)$ , slope =  $-1$

14) through:  $(2, 5)$ , slope = undefined

15) through:  $(3, 1)$ , slope =  $\frac{1}{2}$

16) through:  $(-1, 2)$ , slope =  $2$

Pick any 4 problems from 17-24.  
Write the point-slope form of the equation of the line described. Show work!

17) through:  $(4, 2)$ , parallel to  $y = -\frac{3}{4}x - 5$

$$M = -\frac{3}{4} \quad \perp M = \frac{4}{3} \quad \text{point } (4, 2)$$

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

18) through:  $(-3, -3)$ , parallel to  $y = \frac{7}{3}x + 3$

$$y + 3 = \frac{7}{3}(x + 3)$$

parallel  
= same  
slope

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

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

20) through:  $(-1, 4)$ , parallel to  $y = -5x + 2$

$$M = -5 \quad \perp M = \frac{1}{5} \quad \text{point } (-1, 4)$$

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

21) through:  $(2, 0)$ , parallel to  $y = \frac{1}{3}x + 3$

$$M = \frac{1}{3} \quad \perp M = -3 \quad \text{point } (2, 0)$$

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

22) through:  $(4, -4)$ , parallel to  $y = -x - 4$

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

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

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

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

$$M = -\frac{1}{2} \quad \perp M = 2 \quad \text{point } (-4, -1)$$

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

Point =  $(x_1, y_1)$

Point-slope:  $y - y_1 = m(x - x_1)$

# Pick any three! Show work!

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## Solving Systems of Equations by Substitution

Date \_\_\_\_\_ Period \_\_\_\_\_

Solve each system by substitution.

$$1) \begin{aligned} y &= 6x - 11 \\ -2x - 3y &= -7 \end{aligned}$$

$$\begin{aligned} -2x - 3(6x - 11) &= -7 \\ -2x - 18x + 33 &= -7 \\ -20x + 33 &= -7 \\ -20x &= -40 \\ x &= 2 \end{aligned}$$

$$\begin{aligned} 6(2) - 11 &= 12 - 11 \\ y &= 1 \\ (2, 1) & \quad \boxed{(2, 1)} \end{aligned}$$

$$3) \begin{aligned} y &= -3x + 5 \\ 5x - 4y &= -3 \end{aligned}$$

$\boxed{(1, 2)}$

$$5) \begin{aligned} y &= -2 \\ 4x - 3y &= 18 \end{aligned}$$

$\boxed{(3, -2)}$

$$7) \begin{aligned} -4x + y &= 6 \\ -5x - y &= 21 \end{aligned}$$

$\boxed{(-3, -6)}$

$$9) \begin{aligned} -5x + y &= -2 \\ -3x + 6y &= -12 \end{aligned}$$

$\boxed{(0, -2)}$

$$2) \begin{aligned} 2x - 3y &= -1 \\ y &= x - 1 \end{aligned}$$

$\boxed{(4, 3)}$

$$4) \begin{aligned} -3x - 3y &= 3 \\ y &= -5x - 17 \end{aligned}$$

$$\begin{aligned} -3x - 3(-5x - 17) &= 3 \\ -3x + 15x + 51 &= 3 \\ 12x &= -48 \\ x &= 4 \end{aligned}$$

$$6) \begin{aligned} y &= 5x - 7 \\ -3x - 2y &= -12 \end{aligned}$$

$\boxed{(4, -37)}$

$\boxed{(2, 3)}$

$$8) \begin{aligned} -7x - 2y &= -13 \\ x - 2y &= 11 \end{aligned}$$

$$\begin{aligned} -7(11 + 2y) - 2y &= -13 \\ -77 - 14y - 2y &= -13 \\ -77 - 16y &= -13 \\ -16y &= 64 \\ y &= -4 \end{aligned}$$

$$\boxed{(3, -4)}$$

$$10) \begin{aligned} -5x + y &= -3 \\ 3x - 8y &= 24 \end{aligned}$$

$\boxed{(0, -3)}$

# Pick any three! Show work!

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## Solving Systems of Equations by Elimination

Date \_\_\_\_\_ Period \_\_\_\_\_

Solve each system by elimination.

$$1) \begin{array}{r} -4x - 2y = -12 \\ + 4x + 8y = -24 \\ \hline 6y = -36 \\ y = -6 \end{array}$$

$(6, -6)$

$$3) \begin{array}{r} x - y = 11 \\ 2x + y = 19 \\ \hline 3x = 30 \\ x = 10 \end{array}$$

$(10, -1)$

$$5) \begin{array}{r} -2x - 9y = -25 \\ -4x - 9y = -23 \\ \hline -2x = -2 \end{array}$$

$(-1, 3)$

$$7) \begin{array}{r} -6x + 6y = 6 \\ -1 \quad -6x + 3y = +12 \\ \hline 3y = 18 \\ y = 6 \end{array}$$

$(5, 6)$

$$9) \begin{array}{r} 5x + y = 9 \\ 10x - 7y = -18 \\ \hline 15x = 18 \\ x = 1.2 \end{array}$$

$(1, 4)$

$$11) \begin{array}{r} -3x + 7y = -16 \\ -9x + 5y = 16 \\ \hline -6x + 12y = -32 \end{array}$$

$(-4, -4)$

$$2) \begin{array}{r} 4x + 8y = 20 \\ -4x + 2y = -30 \\ \hline 10y = -10 \\ y = -1 \end{array}$$

$(7, -1)$

$$4) \begin{array}{r} -6x + 5y = 1 \\ + 6x + 4y = -10 \\ \hline 9y = -9 \\ y = -1 \end{array}$$

$(-1, -1)$

$$6) \begin{array}{r} 8x + y = -16 \\ -3x + y = -5 \\ \hline 5x = -11 \\ x = -2.2 \end{array}$$

$(-1, -8)$

$$8) \begin{array}{r} 7x + 2y = 24 \\ 8x + 2y = 30 \\ \hline x = 6 \end{array}$$

$(6, -9)$

$$10) \begin{array}{r} -4x + 9y = 9 \\ x - 3y = -6 \\ \hline -3x + 6y = 15 \\ x = 5 \end{array}$$

$(9, 5)$

$$12) \begin{array}{r} -7x + y = -19 \quad (-3) \\ -2x + 3y = -19 \\ \hline 21x - 3y = 57 \\ -2x + 3y = -19 \\ \hline 19x = 38 \\ x = 2 \end{array}$$

$(2, -5)$

# Pick any 4 from 9-20! Show work!

Find the midpoint of the line segment with the given endpoints.

9)  $(-4, 4), (5, -1)$   $\left( \frac{-4+5}{2}, \frac{4+(-1)}{2} \right) = \left( \frac{1}{2}, \frac{3}{2} \right)$

11)  $(2, 4), (1, -3)$   $\left( \frac{3}{2}, \frac{1}{2} \right)$

13)  $(5, 2), (-4, -3)$   $\left( \frac{5-4}{2}, \frac{2-3}{2} \right) = \left( \frac{1}{2}, -\frac{1}{2} \right)$

15)  $(2, -1), (-6, 0)$   $(-2, -\frac{1}{2})$

17)  $(-5.1, -2), (1.4, 1.7)$   $(-1.85, -0.15)$

19)  $(5.1, 5.71), (6, 3.6)$   $(5.55, 4.655)$

10)  $(-1, -6), (-6, 5)$   $\left( -\frac{7}{2}, -\frac{1}{2} \right)$

12)  $(-4, 4), (-2, 2)$   $\left( \frac{-4-2}{2}, \frac{4+2}{2} \right) = \left( -\frac{6}{2}, \frac{6}{2} \right) = (-3, 3)$

14)  $(-1, 1), (5, -5)$   $(2, -2)$

16)  $(-3.1, -2.8), (-4.92, -3.3)$   $\left( \frac{-3.1-4.92}{2}, \frac{-2.8-3.3}{2} \right) = (-4.01, -3.05)$

18)  $(4.9, -1.3), (-5.2, -0.6)$   $(-1.15, -0.95)$

20)  $(3.1, -2.1), (-0.52, -0.6)$   $(1.29, -1.35)$

Find the other endpoint of the line segment with the given endpoint and midpoint. Extension!

21) Endpoint:  $(-1, 9)$ , midpoint:  $(-9, -10)$   $(-17, -29)$

23) Endpoint:  $(5, 2)$ , midpoint:  $(-10, -2)$   $(-25, -6)$

25) Endpoint:  $(-9, 7)$ , midpoint:  $(10, -3)$   $(29, -13)$

22) Endpoint:  $(2, 5)$ , midpoint:  $(5, 1)$   $(8, -3)$

24) Endpoint:  $(9, -10)$ , midpoint:  $(4, 8)$   $(-1, 24)$

26) Endpoint:  $(-6, 4)$ , midpoint:  $(4, 8)$   $(14, 12)$

Critical thinking questions:

27) Find the point that is one-fourth of the way from  $(2, 4)$  to  $(10, 8)$ .

28) One endpoint of a line segment is  $(8, -1)$ . The point  $(5, -2)$  is one-third of the way from that endpoint to the other endpoint. Find the other endpoint.

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