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Chapter 6 Review

For each type of question, the achievement level is indicated. Showing work is an important strategy in communicating your knowledge and ideas so please be thorough.
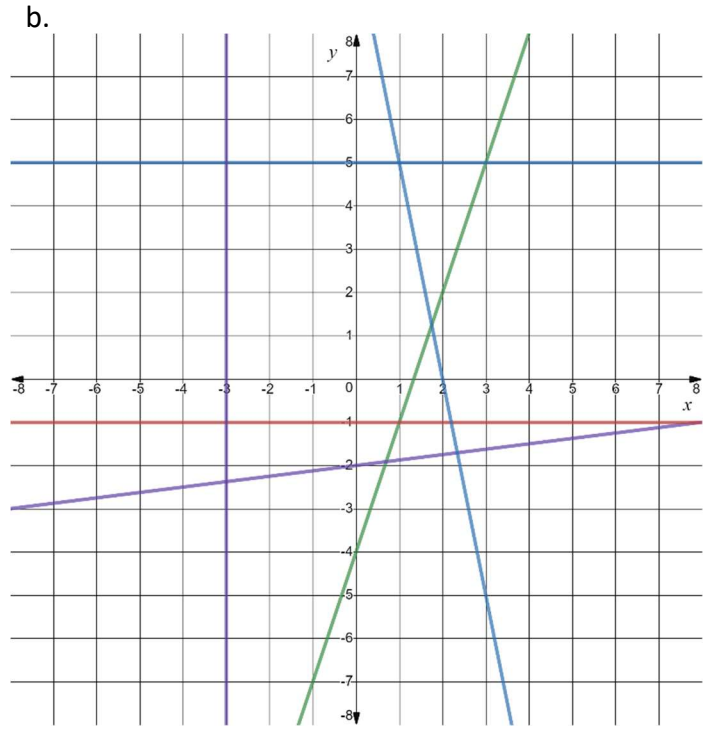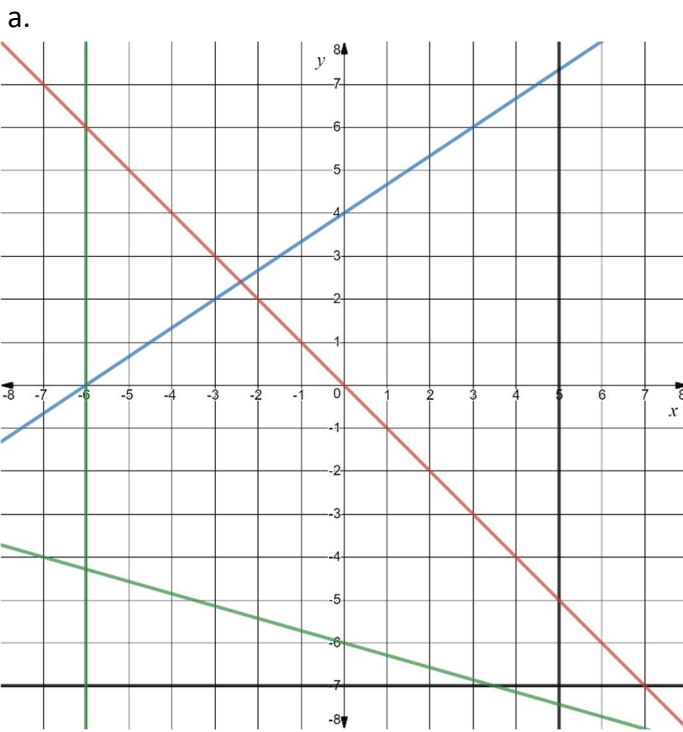
Learning Goal 6.1	Calculating the slope of the line and • Using the slope to graph a line, and • Applying the slope to parallel and perpendicular lines.

Developing
1.   Classify the slope of each line segment as positive, negative, zero or undefined.
Proficient
2.   Find the slope of the lines.

a.

b.

a. undefined	b. negative -1	c. positive $2/3$	i. zero	ii. undefined	iii. negative -5
d. undefined	e. negative $-2/7$	f. zero 0	iv. positive 3	v. zero 0	vi. positive $1/8$

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Proficient
3.   Calculate the slope through the given points.

a. $M(81,53)$ $N(48,36)$ $$9$$	b. $P(10,13)$ $Q(-14,53)$ $$-5/3$$
c. $A(63,76)$ $B(74,43)$ $$-3$$	d. $M(27,41)$ $N(99,32)$ $$-1/8$$
e. $X(12,-34)$ $Y(47,-20)$ $$2/5$$	f. $J(-53,-19)$ $K(-47,2)$ $$7/2$$

Developing
4. Given the original slope of a line,

a. State the slope of a line that would be parallel.		b. State the slope of a line that would be perpendicular.	
$$1/2$$		$$-3/5$$		$$-3/2$$	
‖ $1/2$	⊥ -2	‖ $-3/5$	⊥ $5/3$	‖ $-3/2$	⊥ $2/3$
$$8/7$$		$$3$$		$$-8$$	
‖ $8/7$	⊥ $-7/8$	‖ 3	⊥ $-1/3$	‖ -8	⊥ $1/8$
$$1$$		$$0$$		undefined	
‖ 1	⊥ -1	‖ 0	⊥ undefined	‖ undefined	⊥ 0

Proficient
5.   Find the slope of a line that is:

a. Parallel to a line through the points	b. Perpendicular to a line through the points
$A(63,76)$ and $B(74,43)$ $$-3$$	$X(12,-34)$ and $Y(47,-20)$ $$-5/2$$
$P(10,13)$ and $Q(-14,53)$ $$-5/3$$	$F(81,53)$ a2nd $G(48,36)$ $$-1/9$$
$J(-53,-19)$ and $K(-47,2)$ $$7/2$$	$M(27,41)$ and $N(99,32)$ $$8$$
Extending	
the origin and $(15,-3)$ $$-1/5$$	the origin and $(-6,-12)$ $$-1/2$$

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Learning Goal 6.2	Constructing and using the following forms of a linear equation: • Slope – Intercept Form $y = mx + b$, • Slope – Point Form $y - y_1 = m(x - x_1)$, and • General Form $Ax + By + C = 0$.

Developing	
1. Write the equation slope-intercept of a line with	
a. a slope of 3 and a y-intercept of 1 $y = -3x + 1$	b. a slope of $-1/3$ and a y-intercept of 5 $y = -1/3 x + 5$
c. a slope of $-5/3$ and a y-intercept of -4 $y = -5/3 x - 4$	d. a slope of $3/2$ and a y-intercept of $(0, -1)$ $y = 3/2 x - 1$
e. a slope of $2/5$ and a y-intercept of $(0, 8)$ $y = 2/5 x + 8$	f. a slope of 1 and a y-intercept of $(0, -7)$ $y = x - 7$
2. Write the equation in slope-point of a line with	
a. a slope of 3 through the point $(2, 5)$ $y - 5 = 3(x - 2)$	b. a slope of $-1/3$ through the point $(-9, 2)$ $y - 2 = -1/3 (x + 9)$
c. a slope of $-5/3$ through the point $(3, 0)$ $y = -5/3 (x - 3)$	d. a slope of $3/2$ through the point $(7, -1)$ $y + 1 = 3/2 (x - 7)$
e. a slope of $3/4$ through the point $(-10, 3)$ $y - 3 = 3/4 (x + 10)$	f. a slope of -1 through the point $(-1, -1)$ $y + 1 = -(x + 1)$
g. a slope of $3/2$ through $(6, -2)$ $y + 2 = 3/2 (x - 6)$	h. a slope of $-2/3$ through $(-3, 1)$ $y - 1 = -2/3 (x + 3)$
3. State the slope, $x -$ and $y -$intercepts of the following equations.	

a. $x + 2y + 10 = 0$			b. $2x - 3y - 6 = 0$		
$m = -1/2$	$(-10, 0)$	$(0, -5)$	$m = 2/3$	$(3, 0)$	$(0, -2)$
c. $3x + 6y - 12 = 0$			d. $2x - y + 5 = 0$		
$m = -1/2$	$(4, 0)$	$(0, 2)$	$m = 2$	$(-5/2, 0)$	$(0, 5)$
e. $x + 8y - 2 = 0$			f. $5x + 7y + 11 = 0$		
$m = -1/8$	$(2, 0)$	$(0, 1/4)$	$m = -5/7$	$(-11/5, 0)$	$(0, -11/7)$

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Proficient

4. Determine the equation of each of the following lines. Leave your answer in slope-point form.

a. Line through points $M(1, -3)$ and $N(7, -21)$ $$y + 3 = -3(x - 1)$$	b. Line through points $A(24, 8)$ and $B(4, -7)$ $$y + 7 = \,^3/_4\,(x - 4)$$
c. Line parallel to $y = \,^{-6x}/_5 - 1$ and through $(10, 2)$ $$y - 2 = -\,^6/_5\,(x - 10)$$	d. Line parallel to $y = -x + 2$ and through $(8, 0)$ $$y = -(x - 8)$$
e. Line perpendicular to $y = \,^x/_4 + 5$ and through $(10, 2)$ $$y - 2 = -4(x - 10)$$	f. Line perpendicular to $y = \,^{-2x}/_7$ and through $(0, 2)$ $$y - 2 = \,^7/_2\,x$$

Proficient

5. Graph the following equations

a. $y = 2x + 1$	b. $y = \,^2/_3\,x - 4$	c. $y = 3(x + 2)$

https://www.desmos.com/calculator/pwlcwoosqh

d. $y = x + 3$	e. $y = \,^{-5x}/_4$	f. $y = -x + 2$

https://www.desmos.com/calculator/olvb4uq5md

g. $y = \,^{-6x}/_5 - 1$	h. $y - 2 = \,^{-5}/_4\,(x - 1)$	i. $y + 1 = \,^2/_5\,(x - 4)$

https://www.desmos.com/calculator/grqjylc0on

j. $y - 3 = 2(x + 1)$	k. $y = -\,^1/_2\,(x + 3)$	l. $y + 5 = \,^{-4}/_3\,(x - 1)$

https://www.desmos.com/calculator/xj76qvlp3h

m. $x + 2y + 6 = 0$	n. $3x + 6y - 12 = 0$	o. $x + 6y - 6 = 0$

https://www.desmos.com/calculator/o8vgylfquf

p. $2x - 3y - 6 = 0$	q. $3x - y + 6 = 0$	r. $5x + 7y + 35 = 0$

https://www.desmos.com/calculator/zbykdkk0kv

Chapter 6 Review

Proficient	
1. Find the equation of each of the following lines. Write the equation in all three forms.	
Green	$y = -x - 1$ $y - 3 = -(x + 4)$ $x + y + 1 = 0$
Purple	$y = 2x - 2$ $y - 4 = 2(x - 3)$ $2x - y - 2 = 0$
Black	$y = -3x + 6$ $y - 3 = -3(x - 1)$ $3x + y - 6 = 0$
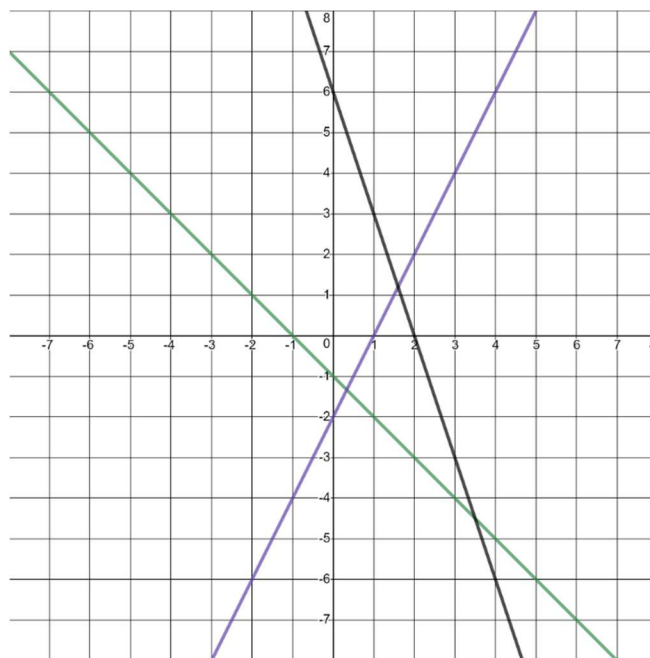
Extending	
2. Determine the equation of each of the following lines. Leave your answer in slope-intercept form.	
a. Line with slope $3/2$ through $(6, -2)$ $y = \frac{3}{2}x - 7$	b. Line with slope $-2/3$ through $(-3, 1)$ $y = \frac{-2}{3}x - 1$
c. Line through points $M(1, -3)$ and $N(7, -21)$ $y = -3x$	d. Line through points $A(24, 8)$ and $B(4, -7)$ $y = \frac{3}{4}x - 10$
e. Line parallel to $y = \frac{-6x}{5} - 1$ and through $(10, 2)$ $y = \frac{-6}{5}x + 14$	f. Line parallel to $y = -x + 2$ and through $(8, 0)$ $y = -x + 8$
g. Line perpendicular to $y = \frac{x}{4} + 5$ and through $(10, 2)$ $y = -4x + 42$	h. Line perpendicular to $y = \frac{-2x}{7}$ and through $(0, 2)$ $y = \frac{7}{2}x + 2$

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For each type of question, the achievement level is indicated. Showing work is an important strategy in communicating your knowledge and ideas so please be thorough.

Learning Goal 6.3	Ability to move between all forms of the equation.

Proficient	
1. Rewrite the following equations in both slope-point form and general form. **THESE ANSWERS ARE EXAMPLES, THERE ARE AN INFINITE NUMBER OF ANSWERS**	
a. $y = 2x + 1$ $y - 5 = 2(x - 2)$ $\qquad$ $2x - y + 1 = 0$	b. $y = \frac{2}{3}x - 4$ $y + 2 = \frac{2}{3}(x - 3)$ $\qquad$ $2x - 3y - 12 = 0$
c. $y = x + 3$ $y - 2 = x + 1$ $\qquad$ $x - y + 3 = 0$	d. $y = \frac{-5x}{4}$ $y - 5 = -\frac{5}{4}(x + 4)$ $\qquad$ $5x + 4y = 0$
e. $y = \frac{-6x}{5} - 1$ $y + 7 = -\frac{6}{5}(x - 5)$ $\qquad$ $6x + 5y + 5 = 0$	f. $y = -x + 2$ $y + 4 = -(x - 6)$ $\qquad$ $x + y - 2 = 0$
Extending	
2. Rewrite the following equations in both slope-intercept form and general form. **SLOPE-INTERCEPT FORM IS UNIQUE, GENERAL FORM IS NOT**	
a. $y - 3 = 2(x + 1)$ $y = 2x + 5$ $\qquad$ $2x - y + 5 = 0$	b. $y + 1 = \frac{2}{5}(x - 4)$ $y = \frac{2}{5}x - \frac{13}{5}$ $\qquad$ $2x - 5y - 13 = 0$
c. $y = -\frac{1}{2}(x + 3)$ $y = -\frac{1}{2}x - \frac{3}{2}$ $\qquad$ $x + 2y + 3 = 0$	d. $y - 2 = \frac{-5}{4}(x - 1)$ $y = -\frac{5}{4}x + \frac{13}{4}$ $\qquad$ $5x + 4y - 13 = 0$
e. $y + 5 = \frac{-4}{3}(x - 1)$ $y = -\frac{4}{3}x - \frac{11}{3}$ $\qquad$ $4x + 3y + 11 = 0$	f. $y = 3(x + 2)$ $y = 3x + 6$ $\qquad$ $3x - y + 6 = 0$

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3. Rewrite the following equations in both slope-intercept form and slope-point form. **SLOPE-INTERCEPT FORM IS UNIQUE, SLPOE-POINT FORM IS NOT**	
a. $x + 2y + 10 = 0$ $y = -1/2\, x - 5$ $\quad$ $y + 2 = -1/2\,(x + 6)$	b. $2x - 3y - 6 = 0$ $y = 2/3\, x - 2$ $\quad$ $y + 4 = 2/3\,(x + 3)$
c. $3x + 6y - 12 = 0$ $y = -1/2\, x + 2$ $\quad$ $y - 1 = -1/2\,(x - 2)$	d. $2x - y + 5 = 0$ $y = 2x + 5$ $\quad$ $y - 3 = 2x(x + 1)$
e. $x + 8y - 2 = 0$ $y = -1/8\, x + 1/4$ $\quad$ $y - 1 = -1/8\,(x + 6)$	f. $5x + 7y + 11 = 0$ $y = -5/7\, x - 11/7$ $\quad$ $y + 3 = -5/7\,(x - 2)$

Extending	
4. Write the equation in slope-intercept form of a line with	
a. a slope of 3 through the point $(2, 5)$ $y = 3x - 1$	b. a slope of $-1/3$ through the point $(-9, 2)$ $y = -x/3 - 1$
c. a slope of $-5/3$ through the point $(3, 0)$ $y = -5/3\, x + 5$	d. a slope of $3/2$ through the point $(7, -1)$ $y = 3/2\, x - 23/2$
e. a slope of $3/4$ through the point $(-10, 3)$ $y = 3/4\, x + 21/2$	f. a slope of -1 through the point $(-1, -1)$ $y = -x - 2$