Name: _____ Date: _____

Chapter 9 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 9.1	Solve linear inequalities.

1. Solve the following inequalities. Show each step and include a number line as part of your solution for full credit.

Developing			
a. $3a + 2 \geq 8$ $a \geq 2$	b. $\frac{b}{2} - 6 < 1$ $b < 14$	c. $\frac{c}{8} + 5.5 \leq 2$ $c \leq -28$	d. $10 > 3d - 12.5$ $d < 7.5$
e. $-5f - 6 \leq 7$ $f \geq -\frac{13}{5}$	f. $-0.5 \geq 8.1 - 2g$ $g \geq 4.3$	g. $250 + 3.5h < 670$ $h < 120$	h. $-22.5 < -2j - 30.5$ $j < -4$
i. $\frac{k}{6} - 1.5 \geq -7$ $k \geq -33$	j. $1.2 > \frac{2m}{3} + 5.1$ $m < -5.85$	k. $\frac{n}{4} + \frac{7}{4} \leq \frac{5}{6}$ $n \leq -\frac{11}{3}$	l. $\frac{5p}{16} - \frac{5}{4} < \frac{p}{4}$ $p < 20$
m. $\frac{122}{c} > 3, c \neq 0$ $c < \frac{122}{3}$	n. $\frac{6}{d} < 2, d \neq 0$ $d > 3$	o. $-2 \leq \frac{6}{f}, f \neq 0$ $f \geq -3$	p. $\frac{6}{-g} \geq -2, g \neq 0$ $g \leq 3$
Proficient			
a. $5(q - 7) < -15$ $q < 4$	b. $2(r + 4) \geq 11$ $r \geq \frac{3}{2}$	c. $-3(s - 2.7) \leq 1$ $s \geq 2.4$	d. $7.6 > -2(-3 - t)$ $t < 0.8$
e. $8.4 < -6(u + 2.4)$ $u < -3.8$	f. $2(-3v + 1.5) \geq 6$ $v \leq -0.5$	g. $5(w - 7.2) \leq 14.5$ $w \leq 10.1$	h. $-8 > 0.4(3.2 + x)$ $x < -23.2$
i. $4y > 7 - 3y$ $y > 7$	j. $-12z < 15 - 15z$ $z < 5$	k. $-10.8 + 7a \leq 5a$ $a \leq 5.4$	l. $6b - 11.34 > 4.2b$ $b > 6.3$

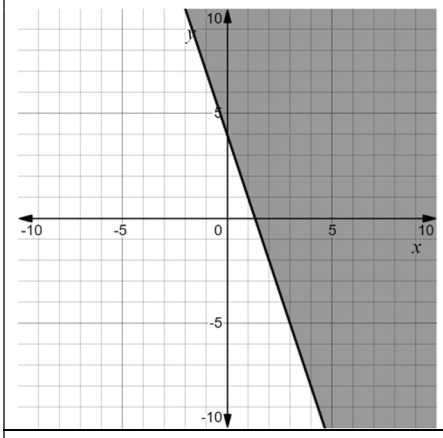
Name: _____ Date: _____

Chapter 9 Review

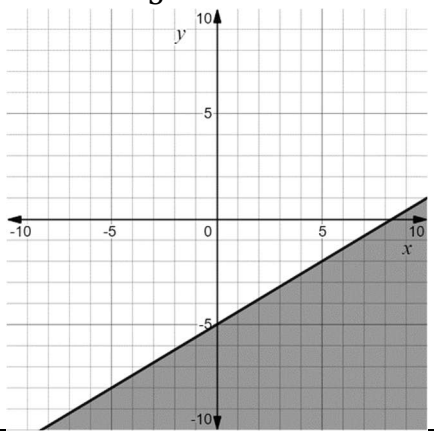
2. Graph the following inequalities.

Proficient

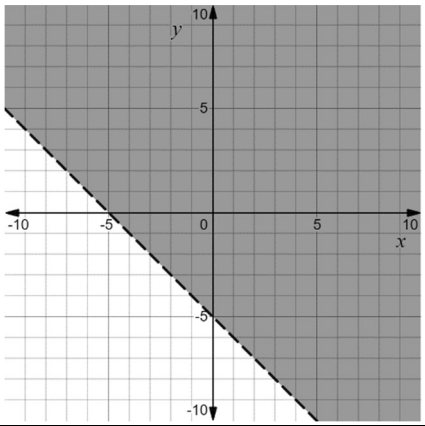
a. $y \leq -3x + 4$



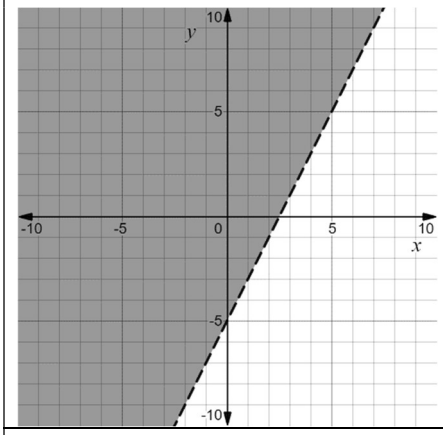
b. $y \leq \frac{3}{5}x - 5$



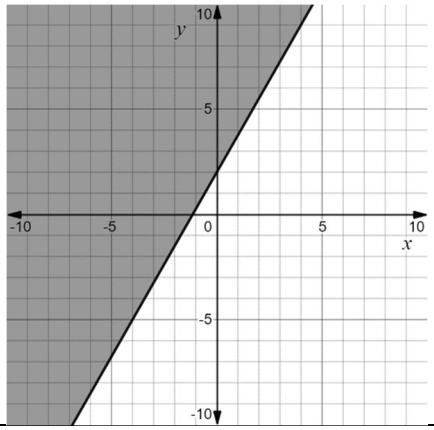
c. $y > -x - 5$



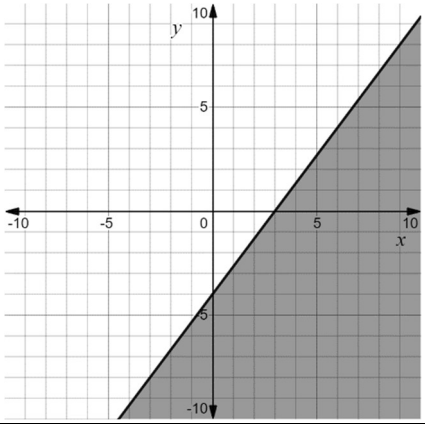
d. $y > 2x - 5$



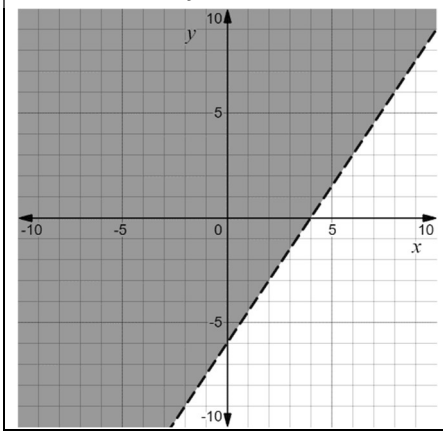
e. $y \geq \frac{7}{4}x + 2$



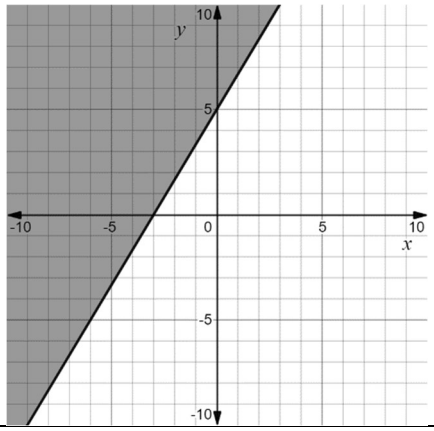
f. $y \leq \frac{4}{3}x - 4$



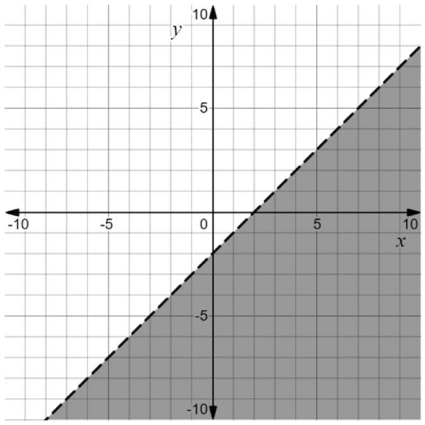
g. $3x - 2y < 12$



h. $5x - 3y \leq -15$



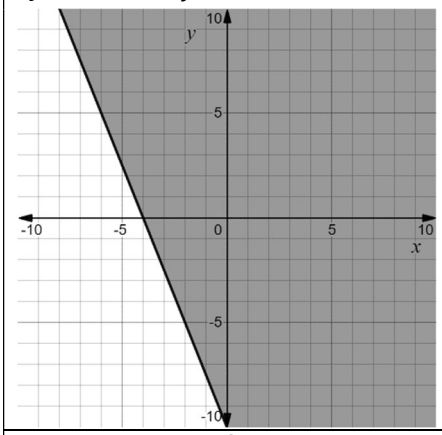
i. $x - y > 2$



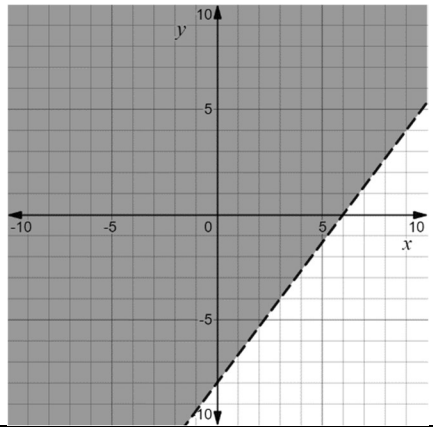
Name: _____ Date: _____

Chapter 9 Review

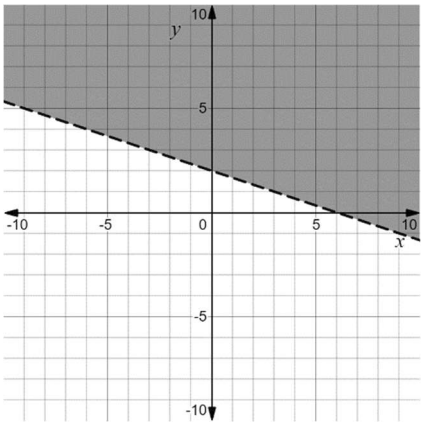
j. $5x + 2y \geq -20$



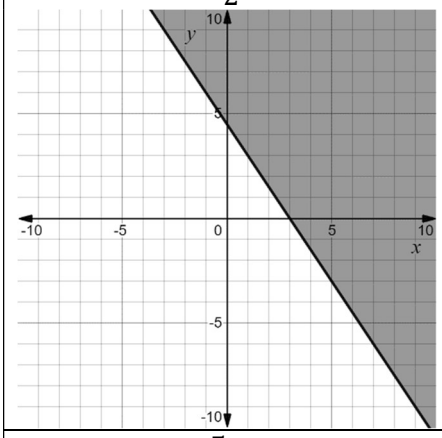
k. $4x - 3y < 24$



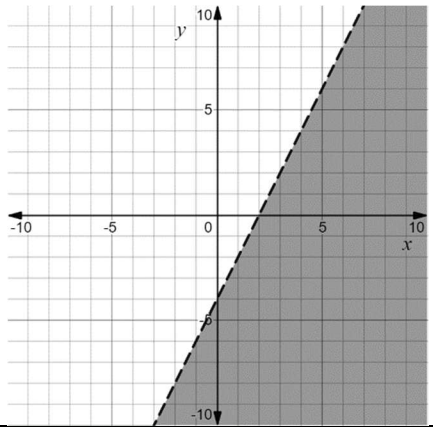
l. $x + 3y > 6$



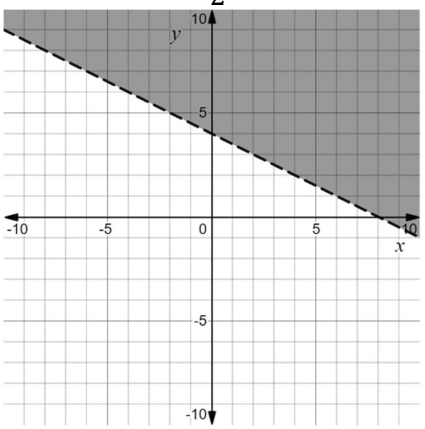
m. $y - 3 \geq -\frac{3}{2}(x - 1)$



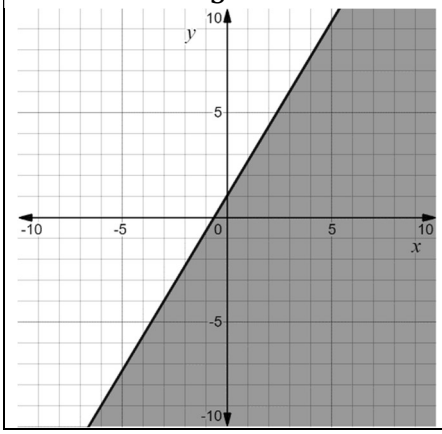
n. $y + 2 < 2(x - 1)$



o. $y - 5 > -\frac{1}{2}(x + 2)$



p. $y + 4 \leq \frac{5}{3}(x + 3)$



Extending
3. The quotient of a number and 15 is no greater than 450. What are the possible values for the number? $x \geq 6\,750$

Name: _____ Date: _____

Chapter 9 Review

4. Adrian works in New York and makes $\$42$ per hour. She works in an office and must get her suit dry cleaned everyday for $\$75$. If she wants to make more than $\$260$ a day, at least how many hours must she work?

$x \geq 8.0$ hours

5. Your brother has $\$2\,000$ saved for a vacation. His airplane ticket is $\$637$. Write and solve an inequality to find out how much he can spend for everything else.

$x \leq \$1\,363$

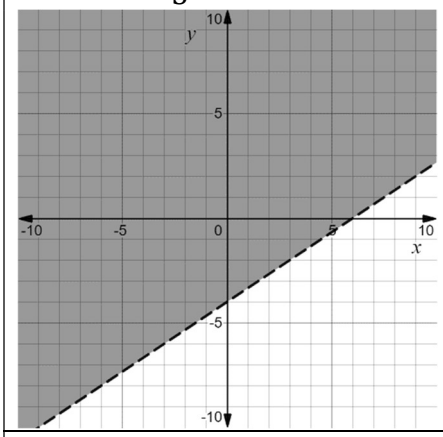
6. Your local bank offers free checking for accounts with a balance of at lest $\$500$. Suppose you have balance of $\$516.46$ and you go out for lunch, which costs you $\$31.96$. How much do you need to deposit to avoid being charged a service fee?

$x \geq \$15.50$

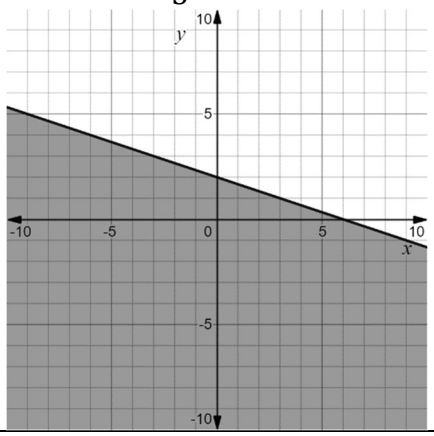
7. Determine the inequality that corresponds to each graph.

Extending

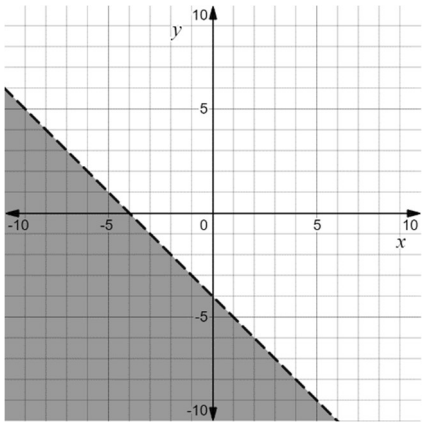
a. $y > \frac{2}{3}x - 4$



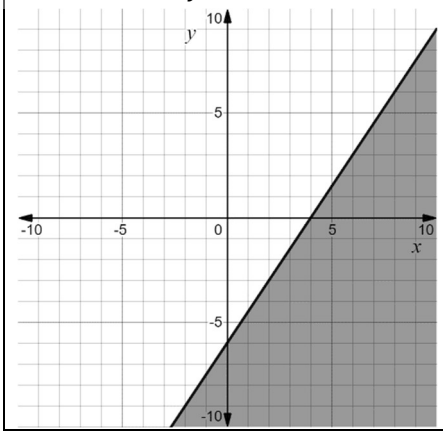
b. $y \leq -\frac{1}{3}x + 2$



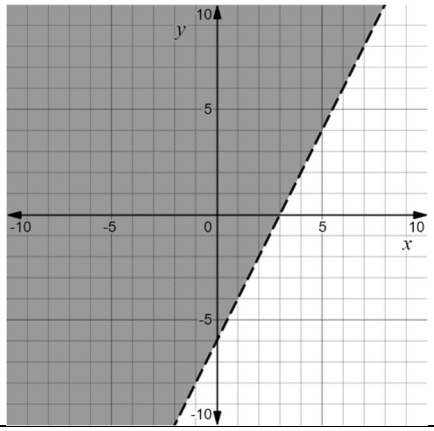
c. $y > -x - 4$



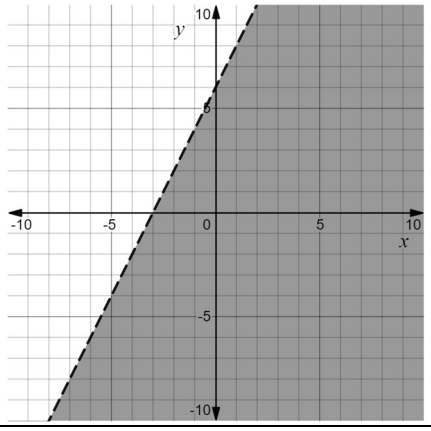
d. $3x - 2y \geq 12$



e. $2x - y < 6$



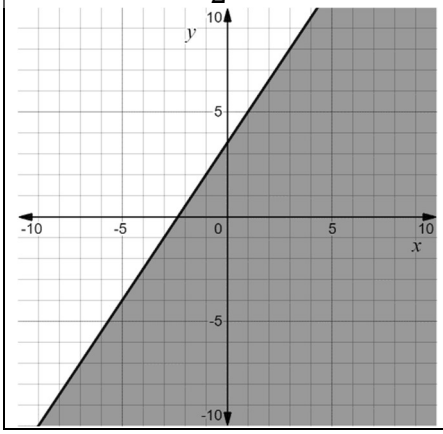
f. $2x - y > -6$



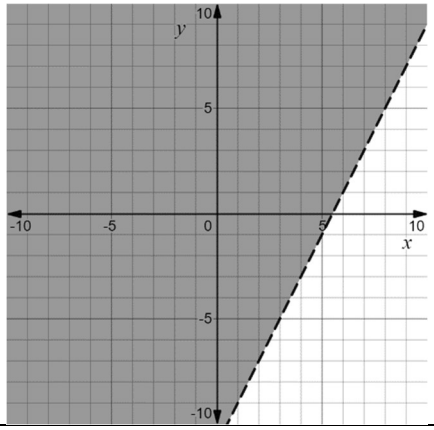
Name: _____ Date: _____

Chapter 9 Review

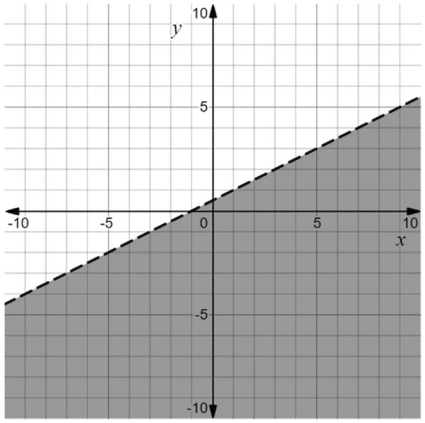
g. $y - 2 \leq \frac{3}{2}(x + 1)$



h. $y + 5 > 2(x - 3)$



i. $y + 2 < \frac{1}{2}(x + 5)$



Name: ___________________________ Date: _______________________

Chapter 9 Review

Name: _____ Date: _____

Chapter 9 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 9.2	Solve quadratic inequalities.

1. Solve the following inequalities. Show each step and include a number line as part of your solution for full credit.

Developing		
a. $x^2 - 2x - 3 \leq 0$ $\{x \mid -1 \leq x \leq 3, x \in \mathbb{R}\}$	b. $x^2 + 2x - 3 \leq 0$ $\{x \mid -3 \leq x \leq 1, x \in \mathbb{R}\}$	c. $x^2 - x - 12 > 0$ $\{x \mid x < -3, x > 4, x \in \mathbb{R}\}$
d. $-x^2 + 3x + 10 < 0$ $\{x \mid x < -2, x > 5, x \in \mathbb{R}\}$	e. $x^2 - 7x - 18 < 0$ $\{x \mid -2 < x < 9, x \in \mathbb{R}\}$	f. $x^2 - 5x - 14 \leq 0$ $\{x \mid -2 \leq x \leq 7, x \in \mathbb{R}\}$
g. $x^2 - 9x + 8 \geq 0$ $\{x \mid x \leq 1, x \geq 8, x \in \mathbb{R}\}$	h. $x^2 - 16x + 63 > 0$ $\{x \mid x < 7, x > 9, x \in \mathbb{R}\}$	i. $x^2 - 25 \geq 0$ $\{x \mid x \leq -5, x \geq 5, x \in \mathbb{R}\}$
j. $x^2 - 13x + 36 < 0$ $\{x \mid 4 < x < 9, x \in \mathbb{R}\}$	k. $x^2 + 3x - 18 > 0$ $\{x \mid x < -6, x > 3, x \in \mathbb{R}\}$	l. $x^2 + 4x - 21 \leq 0$ $\{x \mid -7 \leq x \leq 3, x \in \mathbb{R}\}$
Proficient		
a. $7x^2 - 31x - 20 \leq 0$ $\left\{x \middle\| -\frac{4}{7} \leq x \leq 5, x \in \mathbb{R}\right\}$	b. $7x^2 + 9x < 0$ $\left\{x \middle\| -\frac{9}{7} < x < 0, x \in \mathbb{R}\right\}$	c. $7x^2 - 45x - 28 > 0$ $\left\{x \middle\| x < -\frac{4}{7}, x > 7, x \in \mathbb{R}\right\}$
d. $2x^2 + 17x + 21 < 0$ $\left\{x \middle\| -7 < x < \frac{3}{2}, x \in \mathbb{R}\right\}$	e. $5x^2 - x - 18 \leq 0$ $\left\{x \middle\| -\frac{9}{5} \leq x \leq 2, x \in \mathbb{R}\right\}$	f. $3x^2 - 5x + 2 > 0$ $\left\{x \middle\| \frac{2}{3} < x < 1, x \in \mathbb{R}\right\}$
g. $7x^2 > 32x + 60$ $\left\{x \middle\| x < -\frac{10}{7}, x > 6, x \in \mathbb{R}\right\}$	h. $4x^2 + 30 \leq -43x$ $\left\{x \middle\| -10 \leq x \leq \frac{3}{4}, x \in \mathbb{R}\right\}$	i. $9 < 10x^2 + 89x$ $\left\{x \middle\| x < 9, x > \frac{1}{10}, x \in \mathbb{R}\right\}$
j. $9x^2 > 16$ $\left\{x \middle\| x < -\frac{4}{3}, x > \frac{4}{3}, x \in \mathbb{R}\right\}$	k. $8x^2 > 10x + 3$ $\left\{x \middle\| x < -\frac{1}{4}, x > \frac{3}{2}, x \in \mathbb{R}\right\}$	l. $32x^2 \leq 128$ $\{x \mid -2 \leq x \leq 2, x \in \mathbb{R}\}$

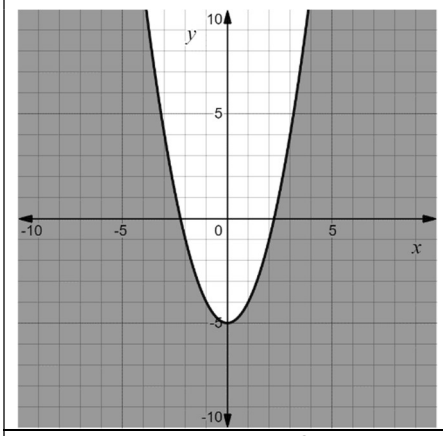
Name: _____ Date: _____

Chapter 9 Review

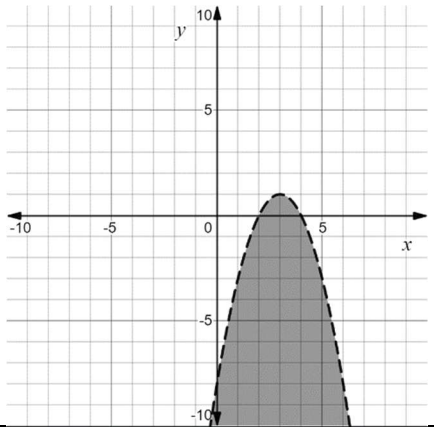
2. Graph the following inequalities.

Proficient

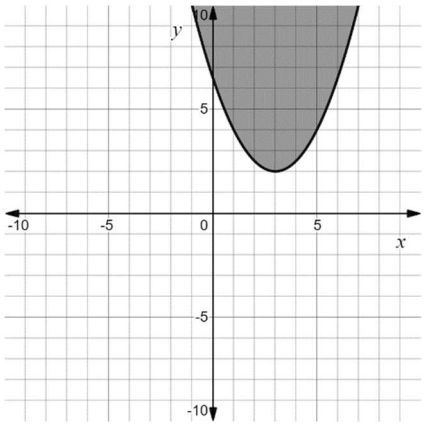
a. $y \leq x^2 - 5$



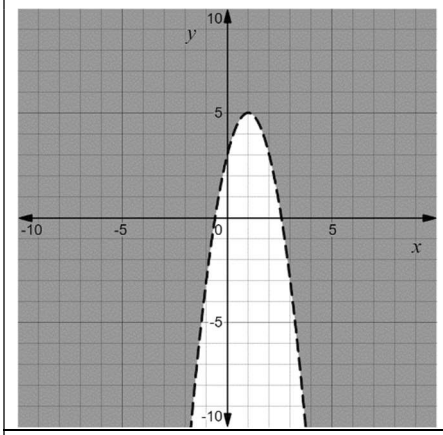
b. $y < -(x-3)^2 + 1$



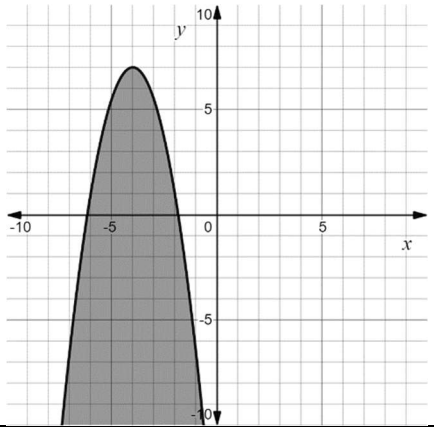
c. $y \geq \frac{1}{2}(x-3)^2 + 2$



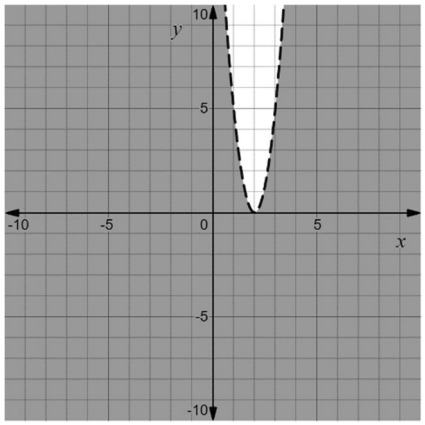
d. $y > -2(x-1)^2 + 5$



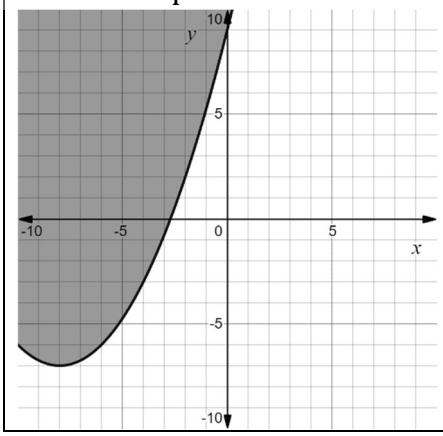
e. $y \leq -\frac{3}{2}(x+4)^2 + 7$



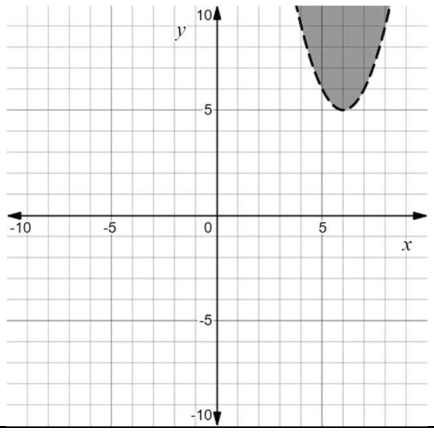
f. $y < 5(x-2)^2$



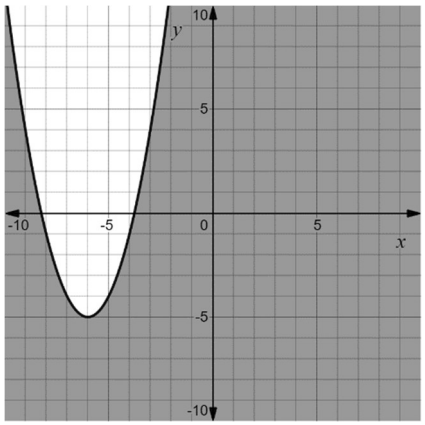
g. $y \geq \frac{1}{4}(x+8)^2 - 7$



h. $y > (x-6)^2 + 5$



i. $y \leq (x+6)^2 - 5$

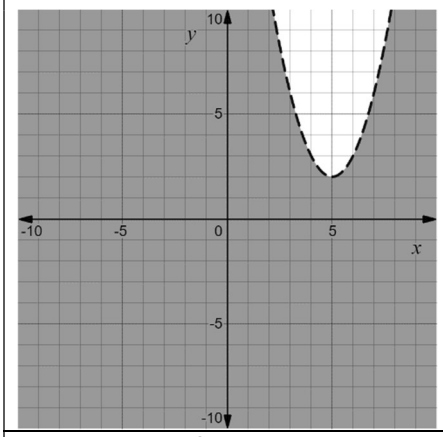


Name: _____ Date: _____

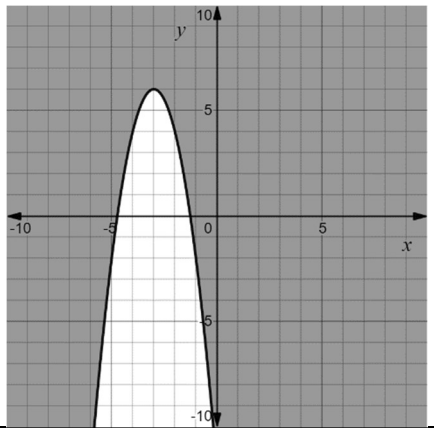
Chapter 9 Review

Extending

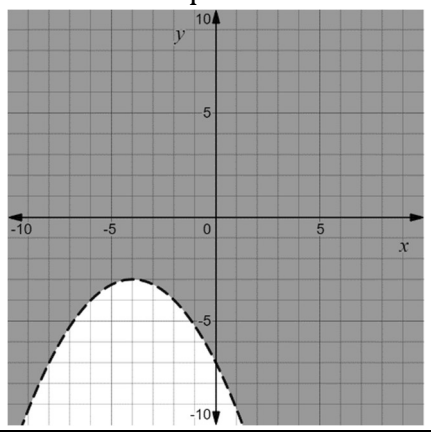
a. $y < x^2 - 10x + 27$



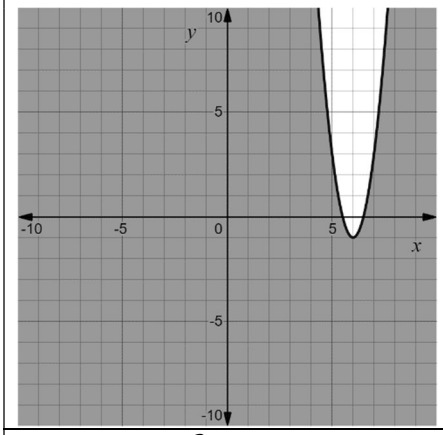
b. $y \geq -2x^2 - 12x - 12$



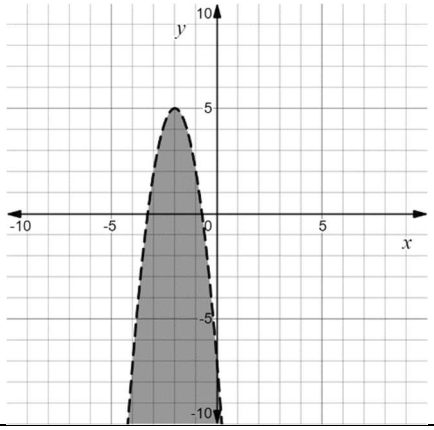
c. $y > -\frac{1}{4}x^2 - 2x - 7$



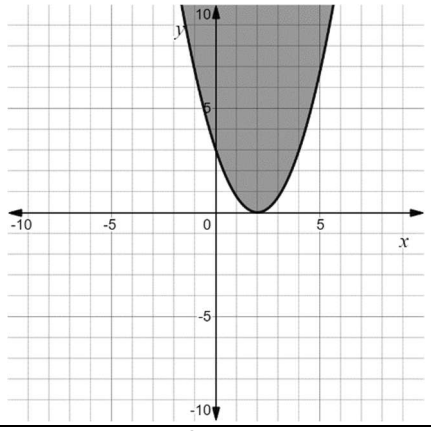
d. $y \leq 4x^2 - 48x + 143$



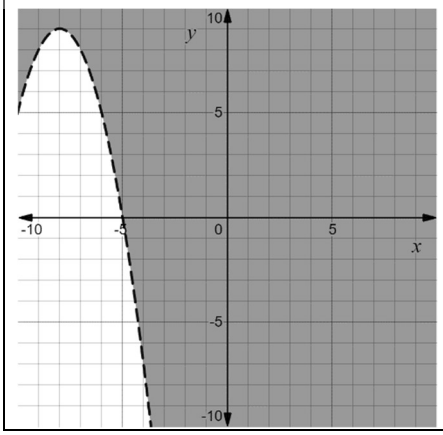
e. $y < -3x^2 - 12x - 7$



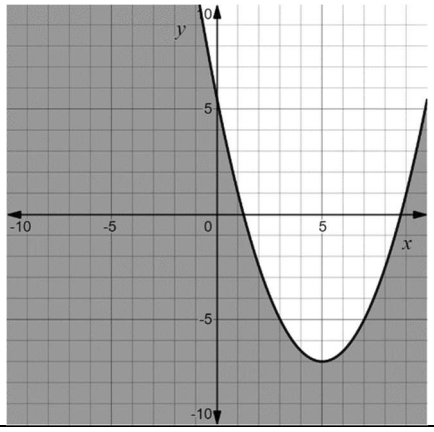
f. $y \geq \frac{3}{4}x^2 - 3x + 3$



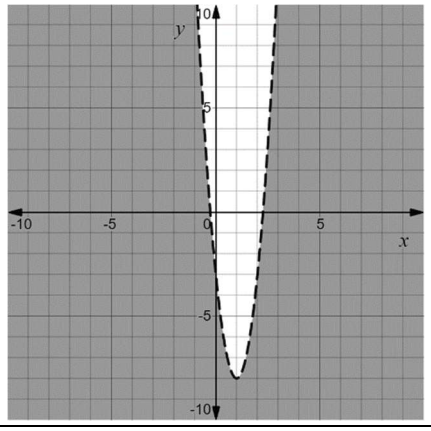
g. $y > -x^2 - 16x - 55$



h. $y \leq \frac{1}{2}x^2 - 5x + \frac{11}{2}$



i. $y < 5x^2 - 10x - 3$



Name: _____ Date: _____

Chapter 9 Review

Extending
3. When a projectile is fired into the air, its height h, in metres, t seconds later is given by the equation $h(t) = 11t - 3t^2$. When is the projectile at least 6 metres above the ground? $\left\{t \middle\| \frac{2}{3} \leq t \leq 3, t \in \mathbb{R}\right\}$
4. When a baseball is hit be a batter, the height of the ball, $h(t)$, at time t, is determined by the equation $h(t) = -16t^2 + 64t + 4.$ For which interval of time is the height of the ball greater than or equal to 52 feet? $\{t \| 1 \leq t \leq 3, t \in \mathbb{R}\}$
5. The surface area, A, of a cylinder with radius r is given by the formula $A = 2r^2 - 5r.$ What possible radii would result in an area that is greater than $12\ \text{cm}^2$? $\{r \| r > 4, r \in \mathbb{R}\}$
6. Suppose Aven drops a ball off the top of a $10-$ foot pool side and the ball follows the projectile $h(t) = -16t^2 + 6,$ where t is the time in seconds and h is the height of the ball. Their friend Riley needs to catch the ball between 2 feet and 5 feet off the top of the water. Between what two times should Riley try to catch the ball? $\left\{t \middle\| \frac{1}{4} \leq t \leq \frac{1}{2}, t \in \mathbb{R}\right\}$