Algebra 1: Chapter 2 Test Review Name ______ Period ______

1. Elena works a part-time job after school to earn money for a summer vacation. She is paid a constant rate for each hour she works. The table shows the amounts of money that Elena earned for various amounts of time that she worked.

   A. What are the dependent and independent quantities in this problem situation?

   Independent: Time worked

   Dependent: Amount earned

| | IQ<br>Time Worked | DQ<br>Amount Earned |
|---|---|---|
| **Units** | Hours | Dollars |
| | 2.5 | 22.50 |
| | 3 | 27.00 |
| | 3.5 | 31.50 |
| | 4.5 ×9 | 40.50 |
| | 5 | 45.00 |
| | 6 | 54.00 |
| **Expression** | $t$ | $9t$ |

   B. Calculate the unit rate of change for the problem situation.

   $(2.5, 22.50)$ $(3, 27.00)$
   $x_1, y_1$ $x_2, y_2$

   $$\frac{27-22.5}{3-2.5} = \frac{4.5}{0.5} = 9$$

   C. Complete the table by filling in the blanks.

   See table

   D. Determine the amount of money that Elena earns for working 7.5 hours.

   $9(7.5) = 67.50$ Elena earns $67.50 for working 7.5 hours.

2. Malik received a $300 gift card from his grandparents to pay for his karate lessons, which cost $30 per month.

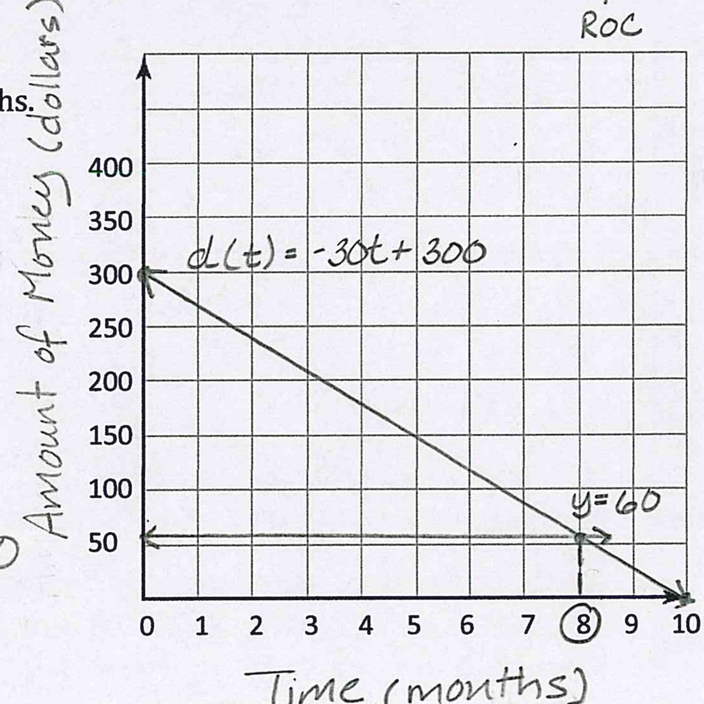
   ↑ starting point ↑ ROC

   A. Write a function that describes the amount of money on the card, $d(t)$, in dollars after $t$ months.

   $d(t) = -30t + 300$

   B. Draw a graph of the function that you wrote in part A. Label your axes.

   See graph.




   C. Use the graph to estimate when there will be $60 left on the gift card.

   8 months

   D. Use your function to determine exactly when there will be $60 remaining on the card.

   $d(t) = 60$ $60 = -30t + 300$

   $-240 = -30t$

   $8 = t$

   E. What is the $y$-intercept? What does it represent?

   y-intercept = 300. It is the initial amount on the gift card

Solve each equation. Combine like terms.

3. $4m + 2m = 3m - 9$

$6m = 3m - 9$
$-3m \quad -3m$
$3m = -9$
$\frac{3m}{3} = \frac{-9}{3}$
$m = -3$

4. $3(x - 4) = 2x + 6x - 9$

$3x - 12 = 8x - 9$
$-8x \quad -8x$
$-5x - 12 = -9$
$+12 = +12$
$\frac{-5x}{-5} = \frac{3}{-5}$
$x = \frac{-3}{5}$

5. $\frac{1}{2}(2x + 8) = 30$

$x + 4 = 30$
$-4 \quad -4$
$x = 26$

Evaluate the function $f(x) = -5.89x + 6.357$ for each value. Round to the 100ths place if necessary.

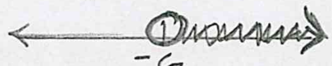
6. $f(2.85) = -5.89(2.85) + 6.357$
$= -16.7865 + 6.357$
$= -10.4295 \approx -10.43$

7. $f(-4) = -5.89(-4) + 6.357$
$= 23.56 + 6.357$
$= 29.917 \approx 29.92$

Solve each inequality. Then, graph on a number line.

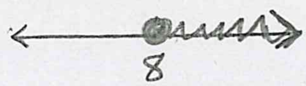
8. $4k + 21 > -3$

$-21 \quad -21$
$\frac{4k}{4} > \frac{-24}{4}$
$k > -6$



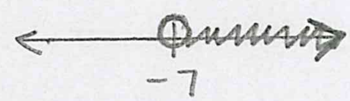

9. $a + 2(a - 12) \geq 0$

$a + 2a - 24 \geq 0$
$3a - 24 \geq 0$
$+24 \quad +24$
$\frac{3a}{3} \geq \frac{24}{3}$
$a \geq 8$

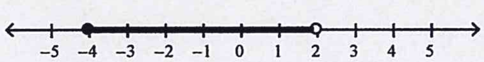



10. $-5x - 7 < 28$

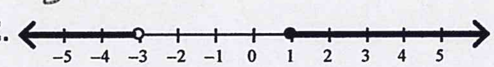
$+7 \quad +7$
$\frac{-5x}{-5} < \frac{35}{-5}$ Flip!
$x > -7$




Write a compound inequality to represent each graph.

11. 


$-4 \leq x < 2$

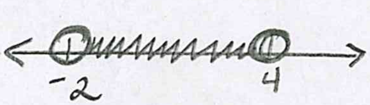
12. 


$x < -3$ or $x \geq 1$

Solve each compound inequality. Graph your solution.

13. $5 < w + 7 < 11$ "AND"

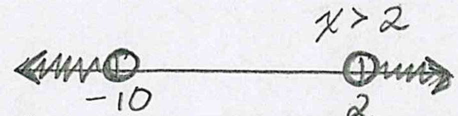
$-7 \quad -7 \quad -7$
$-2 < w < 4$




14. $x - 2 < -12$ *or* $2x + 3 > 7$ "OR"

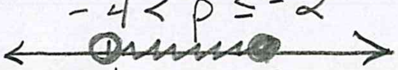
$+2 \quad +2$
$x < -10$

$-3 \quad -3$
$\frac{2x}{2} > \frac{4}{2}$
$x > 2$




15. $7 \leq 3 - 2p < 11$ "AND"

$-3 \quad -3 \quad -3$
$\frac{4}{-2} \leq \frac{-2p}{-2} < \frac{8}{-2}$ Flip!
$-2 \geq p > -4$
or
$-4 < p \leq -2$

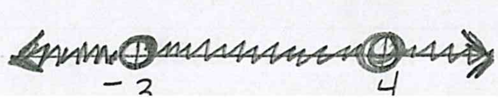


16. $\frac{x}{4} - 2 < -1$ *or* $-3x + 1 < 10$ "OR"

$+2 \quad +2$
$(4)\ \frac{x}{4} < 1(4)$
$x < 4$

$-1 \quad -1$
$\frac{-3x}{-3} < \frac{9}{-3}$
$x > -3$

All real numbers



Define a variable and write an inequality to model the situation.

17. The maximum occupancy of a theater is 300 people.

$x$ = # of people $\quad x \leq 300$

18. Today's temperature if the high is 74 and the low is 53.

$t$ = today's temperature $\quad 53 \leq t \leq 74$

Write an inequality and solve for each of the following.

19. An elevator can safely lift at most 4400 lbs. A concrete block has an average weight of 42 lbs. What is the maximum number of concrete blocks that the elevator can lift?

$x$ = # of concrete blocks $\quad \frac{42x}{42} \leq \frac{4400}{42}$

$x \leq 104.76$

Round down!

The maximum # of concrete blocks the elevator can lift is 104.

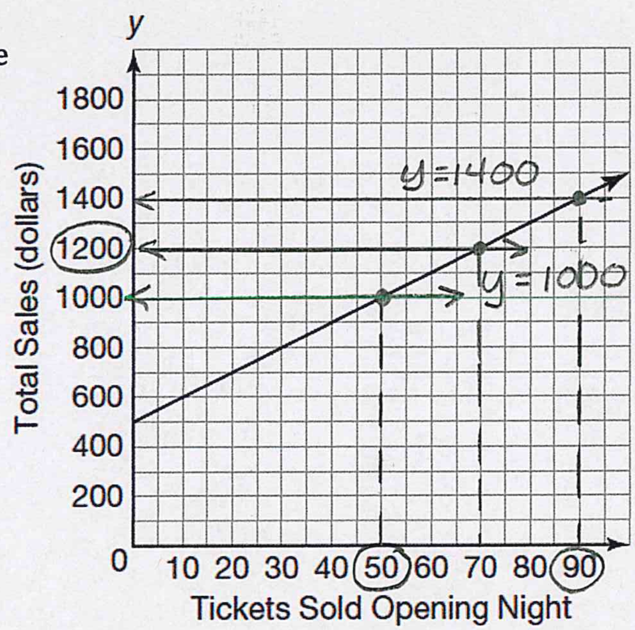
20. What is the greatest number of 34¢ stamps you can buy for $5.00?

$x$ = # of stamps $\quad \frac{0.34x}{0.34} \leq \frac{5.00}{0.34}$

$x \leq 14.7$ Round down!

The greatest # of stamps you can buy for $5.00 is 14.

21. Michael works at the ticket booth of a local playhouse. On the opening night of the play, tickets are $10 each. The playhouse has already sold $500 worth of tickets during a presale. The function $f(x) = 10x + 500$ represents the total sales as a function of tickets sold on opening night.




A. How many tickets can Michael sell and make no more than $1000?

$10x + 500 \leq 1000$

$10x \leq 500$

$x \leq 50 \quad$ 50 tickets

B. Draw a line at $y = 1000$.

See graph

C. Find the point-of-intersection with the graph of the function.

$(50, 1000)$

D. Draw a vertical line from the point-of-intersection to the x-axis. How many tickets can Michael sell to make more than $1000?

$x > 50$

E. How many tickets must Michael sell to make at least $1400? Write an inequality to describe your answer.

$10x + 500 \geq 1400$ ✓ $\quad$ You may also solve using the graph.

$10x \geq 900$

$x \geq 90$

F. How much money will Michael make if he sells exactly 70 tickets?

$x = 70 \quad f(70) = 10(70) + 500$

$= 700 + 500 = 1200$

He will make $1200.

You can also solve using the graph.