Name _____

Date _____

Equations and Functions Test Review

1. QUESTION:

Expand $2(-6x+7)$?

ANSWER: $-12x+14$

2. 4a + 5b   3. 4x + 4y   4. 3r + 10   5. 2x - y

3. 19k + 21   2f + 22   9g + 5   6e + 20   -9y² - 9y

4. a) y = 6   b) x = 35   c) x = 2   d) a = 7   e) d = 6

5. a) x = $2\frac{4}{9}$ b) x = 9

6. QUESTION: Kimi and Jordan are both working during the summer to earn money in addition to their weekly allowances, and they are saving all their money. Kimi earns $9 an hour at her job, and her allowance is $8 per week. Jordan earns $7.50 an hour, and his allowance is $16 per week.

(a) Complete the table below:

Hrs worked in a week	0	1	2	3	4	5	6	7
Kimi's wkly savings								
Jordan's wkly savings								

(b) Write an equation that can be used to calculate the total of Kimi's allowance and job earnings at the end of one week given the number of hours she works.

(c) Write an equation that can be used to calculate the total of Jordan's allowance and job earnings at the end of one week given the number of hours he works.

(d) Sketch the graphs of your two equations on a pair of axes.

(e) Jordan wonders who will save more money in one week if they both work the same number of hours. Write an answer for him.
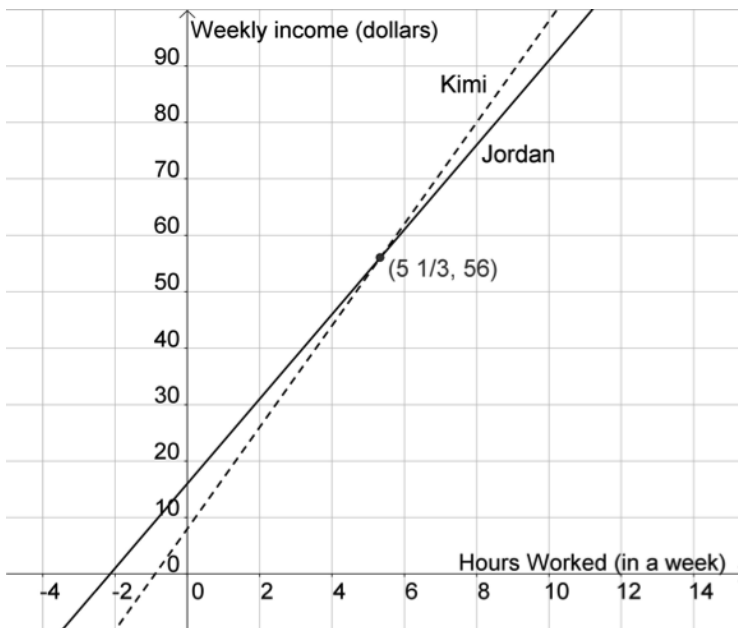
ANSWER: (a)

Hrs worked in a week	0	1	2	3	4	5	6	7
Kimi's wkly savings	8	17	26	35	44	53	62	71
Jordan's wkly savings	16	23.5	31	38.5	46	53.5	61	68.5

(b) $k = 8 + 9h$

(c) $j = 16 + 7.5h$

(d)

(e) Jordan will make more money than Kimi if they work less than $5\frac{1}{3}$ hours. Kimi will make more than Jordan if they work more than $5\frac{1}{3}$ hours.

7. QUESTION: You work for a video streaming company that has two monthly plans to choose from. 1: A flat rate of $7 per month plus $2.50 per video viewed. 2: $4 per video viewed.

(a) What type of functions model this situation? Explain how you know.

(b) Define variables that make sense in the context, and then write an equation for each plan with cost as a function of videos viewed.

(c) How much would 3 videos in a month cost for each plan? 5 videos?

(d) Compare the two plans and explain what advice you would give to a customer trying to decide which plan is best for them, based on their viewing habits.
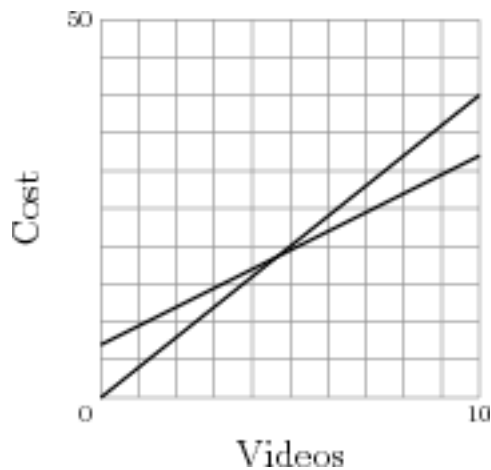
ANSWER: (a) Linear functions. Constant rate per video.

(b) V = # of videos; $Cost_1$; $Cost_2$ $\qquad$ $Cost_1 = 7 + 2.5V$ and $Cost_2 = 4V$

(c)

# of videos	$Cost_1$($)	$Cost_2$($)
1	$9.50	$4
2	$12	$8
3	$14.50	$12
4	$17	$16
5	$19.50	$20

(d) Plan 2 is cheaper for 4 or fewer videos. Plan 1 is cheaper for 5 or more videos.

8. QUESTION: Which of these tables of values satisfy the equation y = 2x + 2? Explain how you checked.

x	0	1	2
y	4	4	5

A

x	1	2	3
y	4	6	8

B

x	-2	-1	1
y	-5	-2	4

C

x	-2	-1	1
y	-2	0	4

D

ANSWER: Tables B and D satisfy the equation y = 2x + 2. Table A is non-linear and table C satisfies the equation y = 3x + 1.

9. QUESTION: Rihanna and Cee Lo Green are renting a car in Shanghai. The rental company posts its rates in the table below:

Days	Cost
1	$30
2	$40
3	$50
4	$60

Rihanna and Cee Lo Green are renting for 7 days, and the clerk says that it will cost $85. Rihanna thinks the clerk is trying to cheat them. Cee Lo Green insists she is not. Write an equation and sketch a graph to figure out who is right.

ANSWER:

$c = 20 + 10d$ (The cost is \$20 plus \$10 per day). Cee Lo is right. The clerk is actually
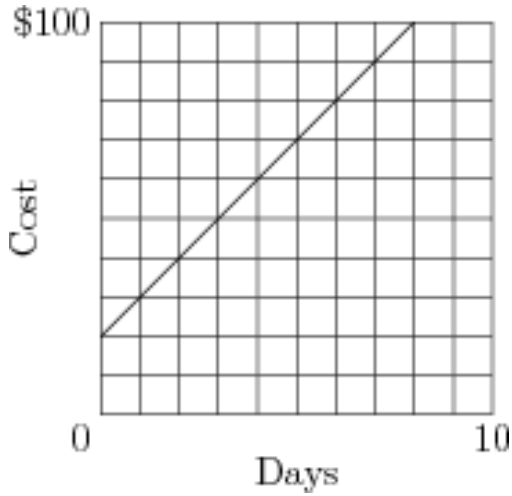
under-charging them by \$5.

10. QUESTION: Determine which of the following equations are linear:
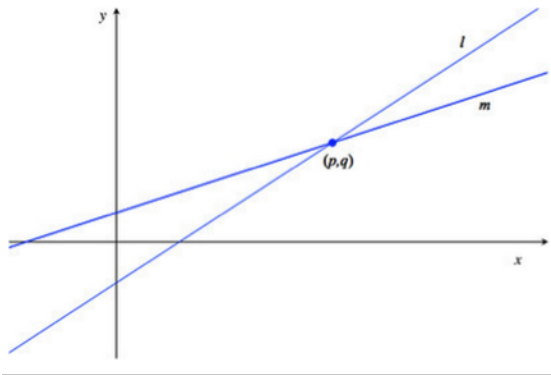
$y = x^2 + 5x + 6$

$y = x^3$

$y = \frac{1}{x}$

$y = x(2 + x)\ y = 7x + 6$

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

ANSWER: $y = x(2 + x)$, $y = 7x + 6$, $y = \frac{x}{2}$

11. QUESTION: The figure below shows the lines l and m described by the equations 4x-y=c and y=2x+d respectively, for some constants c and d. They intersect at the point (p,q).

(a) How can you interpret c and d in terms of the graphs of the equations above?

(b) Imagine you place the tip of your pencil at point (p,q) and trace line l out to the point with x-coordinate p+2. Imagine I do the same on line m. How much greater would the y-coordinate of your ending point be than mine?

ANSWER:

(a) If we put the equation 4x-y=c in the form y=4x-c, we see that the graph has slope 4. The slope of the graph of y=2x+d is 2. So the steeper line, l, is the one with equation y=4x-c, and therefore -c is the y-coordinate of the point where l intersects the y-axis. The other line, m, is the one with equation y=2x+d, so d is the y-coordinate of the point where m intersects the y-axis.

(b) The line l has slope 4. So on l, each increase of one unit in the x-value produces an increase of 4 units in the y-value. Thus an increase of 2 units in the x-value produce an increase of $2 \cdot 4=8$ units in the y-value. The line m has slope 2. So on L2, each increase of 1 unit in the x-value produces an increase of 2 units in the y-value. Thus an increase of 2 units in the x-value produces an increase of $2 \cdot 2=4$ units in the y-value.your y-value would be 8-4=4 units larger than my y-value.