Package #3 - Solutions (Function)

1. $y = mx + b$

$m = \frac{\Delta y}{\Delta x} = \frac{-1}{3}$

$b = y\text{int}$ (when $x = 0$, what is y?)

$b = 3$

Rule: $y = -\frac{1}{3}x + 3$

2. $y = mx + b$

$m = \frac{\Delta y}{\Delta x} = \frac{10}{5} = 2$

$b = 30$

Rule: $y = 2x + 30$

3. $y = mx + b$

$m = \frac{\Delta y}{\Delta x} = \frac{2}{1} = 2$

$b = 11$

Rule: $y = 2x + 11$

4

$y = mx + b$

$m = \frac{\Delta y}{\Delta x} = \frac{3}{2}$

$b = 1$

Rule: $y = \frac{3}{2}x + 1$

5

$y = mx + b$

$m = \frac{\Delta y}{\Delta x} = \frac{-10}{1} = -10$

$b = 0$

Rule: $y = -10x + 0$

$y = -10x$

6

$t = r + 17$

$t = 25$

$r = ?$

Replace (substitute) t with 25 and solve for r

$25 = r + \cancel{17}$

$-17 \quad -\cancel{17}$

$8 = r$

7 $t = n^2$

check $n=1$ $t = (1)^2 = 1$

$n=2$ $t = (2)^2 = 4$

$n=3$ $t = (3)^2 = 9$

$\vdots$

etc.

8 $t = 15$

$r = ?$

$t = r + 6$

$15 = r + 6$

$-6 \qquad -6$

$11 = r$

9 $t = n^2 + 13$

$n = 0$ $t = (0)^2 + 13$

$= 0 + 13$

$= 13$

$n = 1$ $t = (1)^2 + 13$

$t = 1 + 13$

$t = 14$

$n = 2$ $t = (2)^2 + 13$

$t = 4 + 13$

$t = 17$

$n = 3$

$t = (3)^2 + 13$

$t = 9 + 13$

$t = 22$

$S = \{13, 14, 17, 22, \ldots\}$

10 $t = 2^n$

$n = 0 \quad t = 2^0$

$t = 1$

$n = 1 \quad t = 2^1$

$t = 2$

$S = \{1, 2, 4, 8, \ldots\}$

$n = 2 \quad t = 2^2$

$t = 4$

$n = 3 \quad t = 2^3$

$t = 8$

11 variable (changing) = # of animals

constant (no change) = surface area

12 dependent variable (y value) = # of bricks laid

13 independent variable = time elapsed

14 independent variable = # of games played

15 dependent variable = total amount of money earned

16 Z (0,0)

17 C (-2, -8)

18 X-axis: C (8, 0)

19 G(2,2)

20 M(4,4)

21 $y = mx + b$

Read graph from left to right and list points in table of values

x	y
-2	-3
0	0
2	3

$m = \frac{\Delta y}{\Delta x} = \frac{3}{2}$

$b = 0$

$\therefore$ Rule: $y = \frac{3}{2}x + 0$

$y = \frac{3}{2}x$

22 $y = mx + b$

x	y
-1	2
0	1
1	0

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

$b = 1$

$\therefore$ Rule: $y = 1x + 1$

$y = x + 1$

23 $y = mx + b$

x	y
-2	2
0	4
2	-8

$m = \frac{\Delta y}{\Delta x} = \frac{2}{2} = 1$

$b = 4$

Rule: $y = 1x + 4$

$y = x + 4$

24 $y = mx + b$

x	y
-4	-4
0	2
4	8

$m = \frac{\Delta y}{\Delta x} = \frac{4}{4} = 1$

$b = 2$

$\therefore$ Rule: $y = 1x + 2$

$y = x + 2$

25 $y = mx + b$

x	y
-1	5
0	0
1	-5

$m = \frac{\Delta y}{\Delta x} = \frac{5}{1} = 5$

$b = 0$

$\therefore$ Rule: $y = 5x + 0$

$y = 5x$

26 (-4, 8)
(-1, 2)
(6, 3)
(7, -5)

27 (5, 2)
(7, -1)
(-8, 3)
(9, -6)

Intro To Functions: Test #1

2 $t = r + 2$

$\underline{r = 0}$ $t = 0 + 2$, $t = 2$

$\underline{r = 3}$ $t = 3 + 2$, $t = 5$

$\underline{r = 7}$ $t = 7 + 2$, $t = 9$

<u>Sum</u> of terms: $2 + 5 + 9 = 16$

3 Refer to graph on following page

4 a Ice cream sales

b # of spectators

c growth of a plant

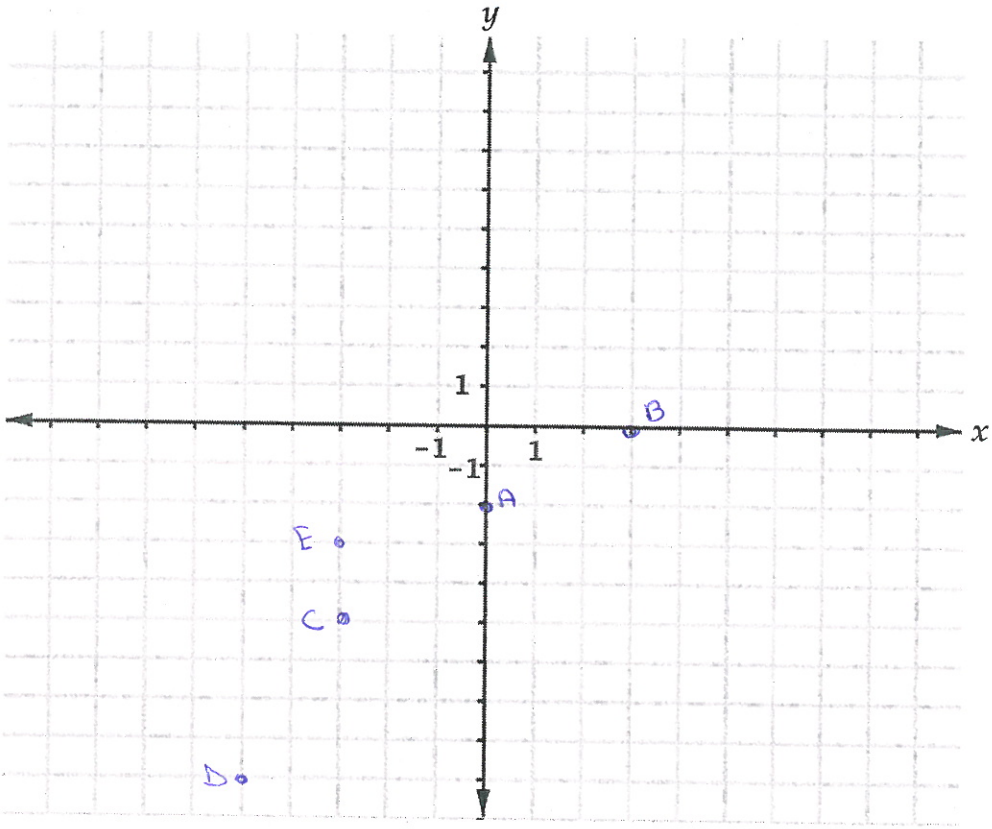
Introduction to Functions: Chapter Test 1

1. Give the next 3 terms in the sequence: $\frac{-1}{9}, \frac{1}{3}, -1, 3, __, __, __$.

2. Using the rule $t = r + 2$, find the sum of the terms (t) which have ranks (r) of 0, 3 and 7.

3. Plot and label the following coordinates on the Cartesian plane below:

A (0,-2); B (3,0); C (-3,5); D (-5,-9); E (-3,-3)



4. In the following scenarios identify the dependent variables by circling them:

   a. Ice cream sales are said to go up when the temperature gets hotter.

   b. As it was getting closer to game time, the number of spectators entering the stadium increased.

   c. To assist the growth of a plant, fertilizer is added to the soil on a regular basis.

6 b $y = mx + b$

$m = \frac{\Delta y}{\Delta x} = \frac{5}{1} = 5$

$b = -2$

<u>Rule</u>: $y = 5x - 2$

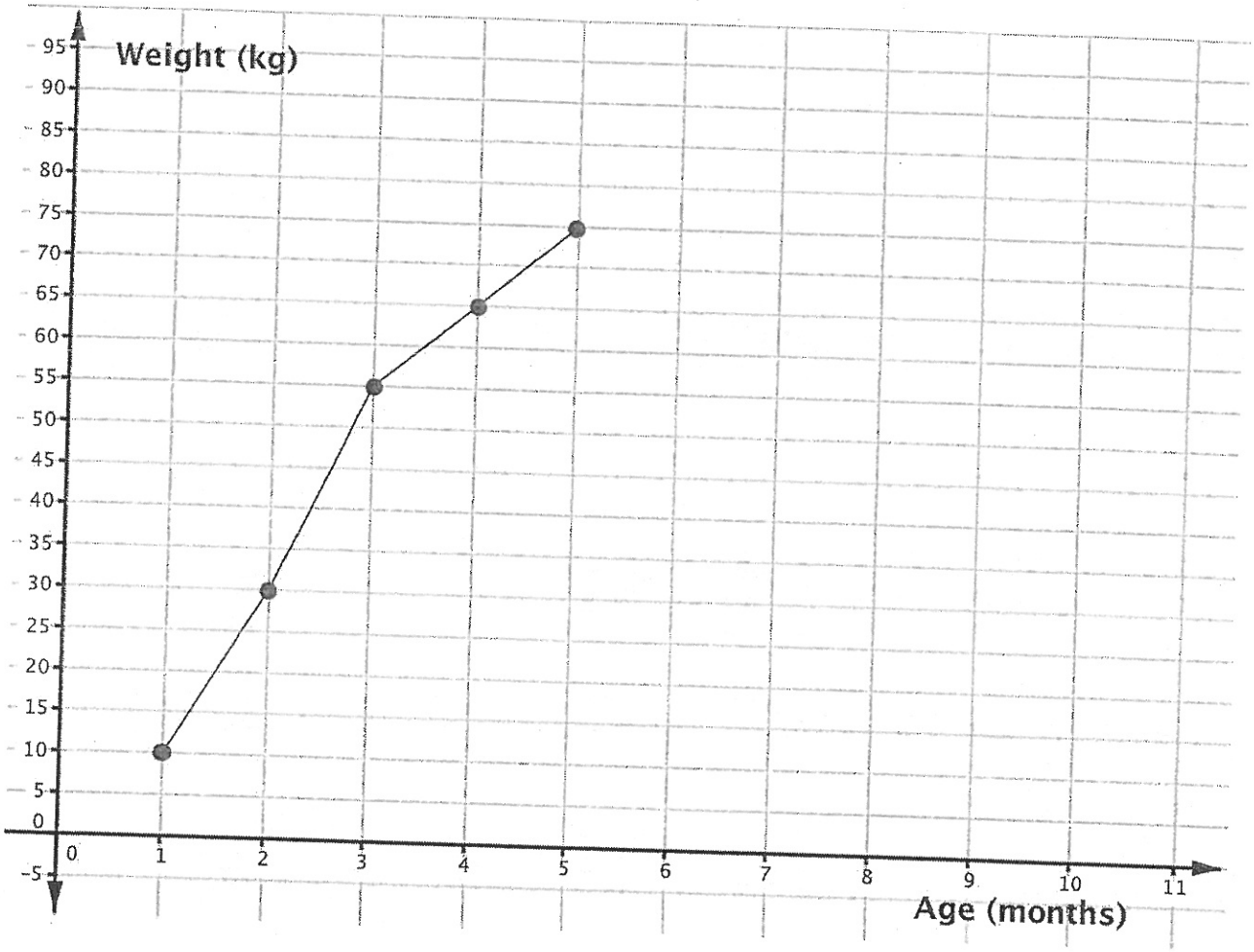
7a. $y = 3x - 1$

x	y
-2	$y = 3(-2) - 1 = -6 - 1 = -7$
1	$y = 3(1) - 1 = 3 - 1 = 2$
4	$y = 3(4) - 1 = 12 - 1 = 11$
8	$y = 3(8) - 1 = 24 - 1 = 23$

7b.

x	$y = 2x^2 + 1$
-2	$y = 2(-2)^2 + 1 = 2(4) + 1 = 8 + 1 = 9$
1	$y = 2(1)^2 + 1 = 2(1) + 1 = 2 + 1 = 3$
4	$y = 2(4)^2 + 1 = 2(16) + 1 = 32 + 1 = 33$
5	$y = 2(5)^2 + 1 = 2(25) + 1 = 50 + 1 = 51$

5. The following graph shows the increase in weight of a Saint Bernard puppy over the span of a year:



Fill in the following table of values to represent this situation:

Age of puppy (months)	Weight of puppy (kg)
1	10
2	30
3	55
4	65
5	75

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6. Use the table of values below to obtain a rule.

a.

x	y
2	3
3	8
4	15
5	24

b.

x	y
0	-2
1	3
2	8
3	13

7. Given the rule below, complete the following table of values.

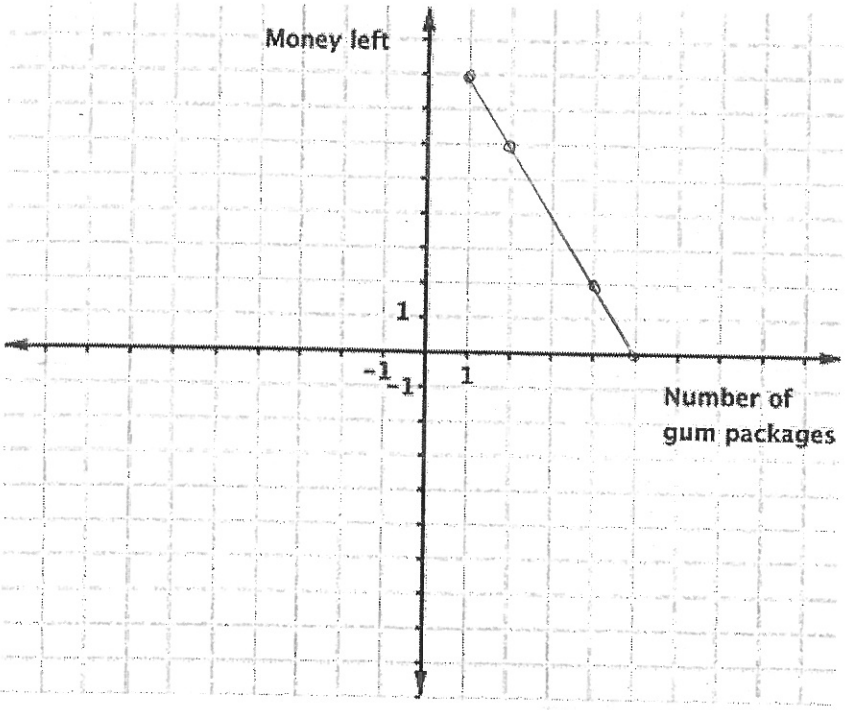
a. $y = 3x - 1$

x	y
-2	
1	
4	
8	

b. $y = 2x^2 + 1$

x	y
-2	
1	
4	
5	

8. The rule that relates the money left over and the number of packages of gum bought at $2 each, if a person had $10 at the start is given by $y = 10 - 2x$. Complete the table of values and plot the coordinates obtained on the Cartesian plane.



Number of gum packages	Money left($)
1	8
2	6
4	2
5	0

(9) $y = mx + b$

x	y
-4	6
0	4
2	3

$m = \frac{\Delta y}{\Delta x} = \frac{-2}{4} = -\frac{1}{2}$

$b = 4$

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

(10) Line #1:

x	y
-2	0
0	4
2	8

$m = \frac{\Delta y}{\Delta x} = \frac{4}{2} = 2$

$b = 4$

(1) $y = 2x + 4$

Line #2:

x	y
-6	4
-2	0
0	-2
2	-4

$m = \frac{\Delta y}{\Delta x} = \frac{-4}{4} = -1$

$b = -2$

(2) $y = -1x - 2$

$y = -x - 2$

1. C

2. e [D (2, 0)]

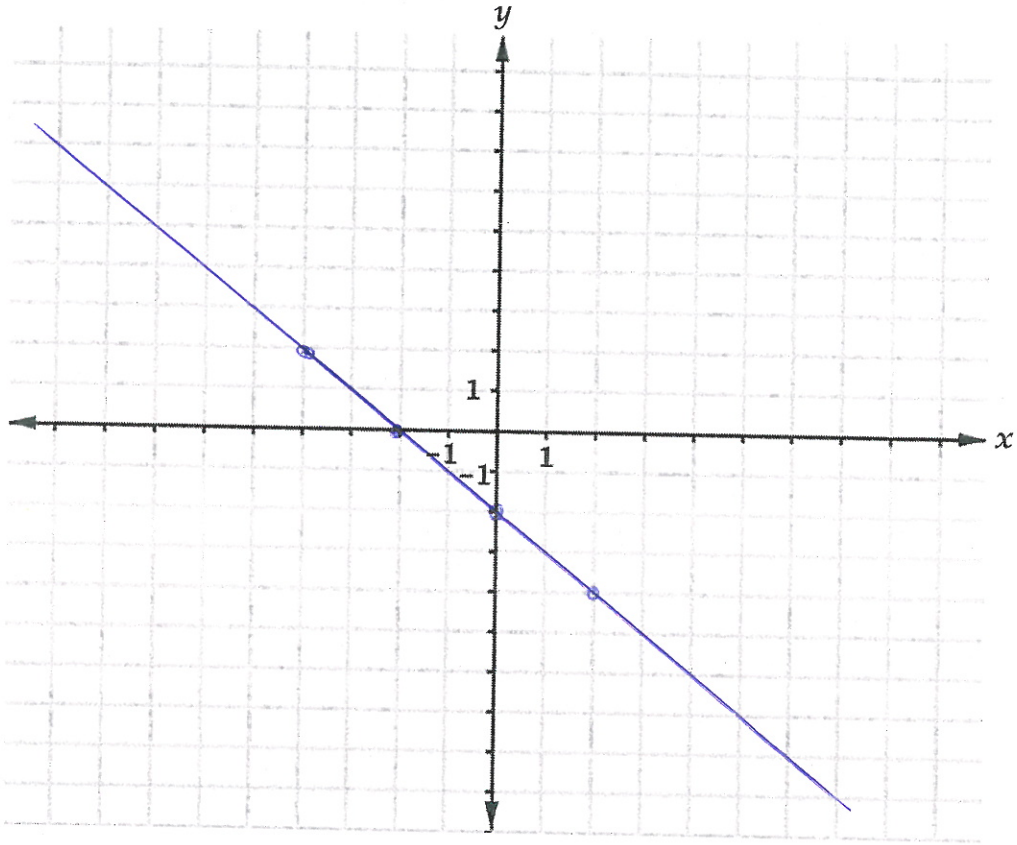
3. c (rate is neg)

4. f [initial value is what y = when x = 0]

5. Quadrant Two

Extension * Other answers possible

11. Draw a line that such that it has a decreasing rate and it intersects with the x-axis at -2. Label and name 3 other coordinates on your line. Give the rule of your line.



Read graph from left to right ⇒ decreasing

x	y
-4	2
-2	0
0	-2
2	-4

$m = \frac{\Delta y}{\Delta x} = \frac{-2}{2} = -1$

$b = -2$

$\therefore y = -1x - 2$

$= -x - 2$

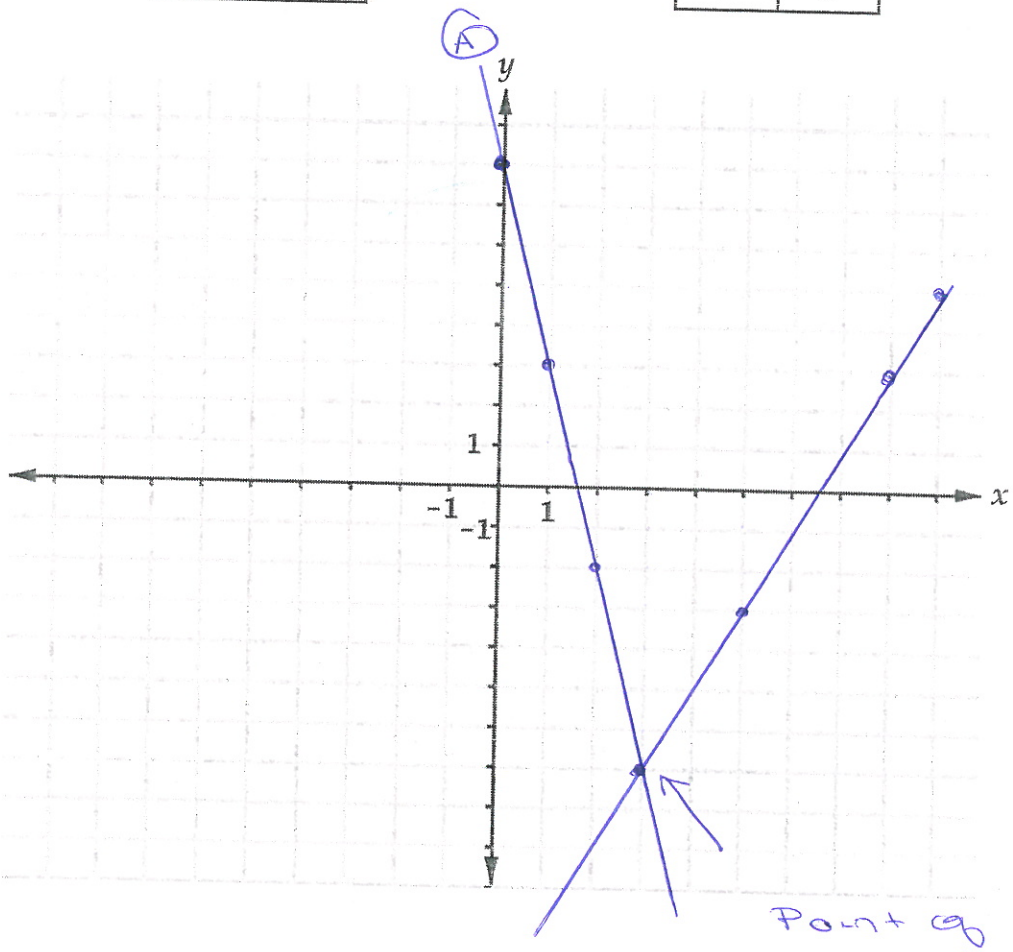
12. Plot the coordinates obtained from table A and B on the Cartesian plane below. Connect the coordinates from table A to form a line. Connect the coordinates from table B to form a second line. At what coordinate do the two lines meet?

Table A

x	y
0	8
1	3
2	-2
3	-7

Table B

x	y
3	-7
5	-3
8	3
9	5



Point of intersection
(3, -7)

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