Linear Relations Assignment – Key

63

For #1 to #3, select the best answer.

Use the pattern below to answer #1 and #2.

Figure 1   Figure 2   Figure 3

1. Which table of values best represents the pattern?

A

Figure Number (f)	1	2	3	4
Number of Sides (s)	18	36	54	72

B

Figure Number (f)	1	2	3	4
Number of Sides (s)	18	28	38	48

Ⓒ

Figure Number (f)	1	2	3	4
Number of Sides (s)	12	20	28	36

D

Figure Number (f)	1	2	3	4
Number of Sides (s)	12	24	36	48

T

2. Which equation represents the pattern? $M = \dfrac{(36-12)}{(4-1)}$

A $s = 12f$ **Ⓑ** $s = 8f + 4$ $= \dfrac{24}{3}$

C $s = 10f + 8$ **D** $s = 18f$ $= 8$

3

3. Which equation represents this graph?

$Rise = 30$

$Run = 10$

$M = \dfrac{30}{10}$

$= 3$
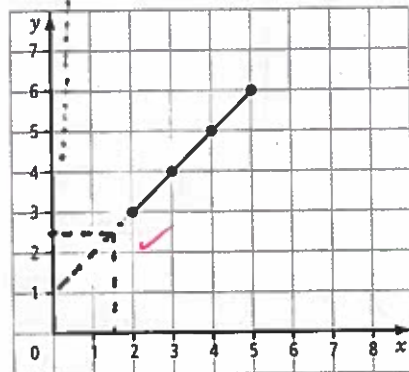
A $d = 2t + 4$ **B** $d = 4t - 1$

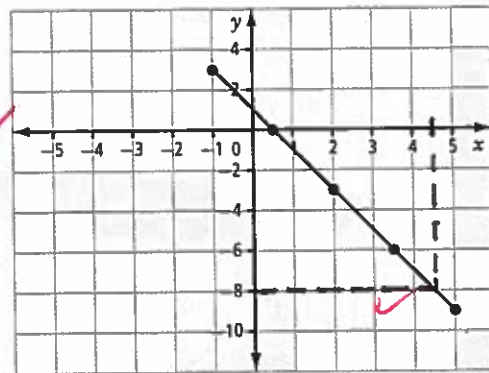**Ⓒ** $d = 3t + 3$ **D** $d = t + 5$

3
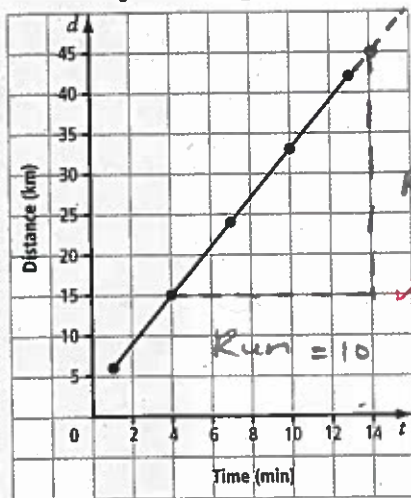
Complete the statements in #4 and #5.

4. When $x = 1.5$ on the graph, the approximate y-coordinate is ■.

$y \approx 2.5$ ✓

2

5. When $y = -8$ on the graph, the approximate x-coordinate is ■.

$x \approx 4.5$ ✓

Short Answer

6. A number pattern starts with the number -2. Each number is 4 less than the previous number.

   a) Make a table of values for the first numbers in the pattern.

   b) What equation can be used to determine each number in the pattern? Verify answer.

   c) What is the value of the 11th number the pattern?

**7.** A cheese party pizza costs $21.25. The graph shows the cost of adding additional toppings.

Cost of Pizza

Cost ($) vs Number of Toppings
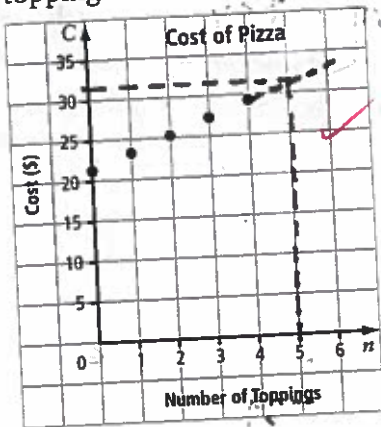
a) 2   What is the approximate cost of a party pizza with five toppings? Cost ≈ $31 ✓

b) 2.   Is it reasonable to interpolate values on this graph? Explain. It is not reasonable to interpolate b/c you cannot have partial values of toppings.

8. Create a table of values and a graph for each equation.

a) $y = -2x + 6$

b) $y = 2x - 6$

c) $y = 6$

9. How are the graphs in #8 similar? How are they different?

Extended Response

10. A cross-country ski-park contains five different trails. The diagram shows the trails, with each trail being successively larger.

2 km

Trail 1   Trail 2   Trail 3   Trail 4   Trail 5
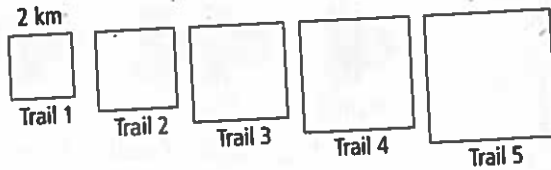
Each side length of the shortest trail is 2 km. The side length of each consecutive trail is 0.5 km longer than the previous one.

a) Construct a table of values to show the relationship between the trail number and the total distance of each trail.

b) What equation represents the relationship?

c) Graph the linear relation.

d) If a sixth trail were added, what would be its total distance?

Math Link: Wrap It Up!

You are planning a canoe trip with some friends. Where are you going? How long will your trip be? How many people are going?

You are in charge of ordering food supplies to meet the energy requirements of your group. For the trip, the amount of food energy required by a canoeist can be modelled by the equation $a = \dfrac{C}{100} - 17$, where a represents the person's age and C represents the number of calories.

Use the Internet, travel brochures, or other sources to find information about your trip.

a) Write a paragraph describing your trip.

b) Create a table of values for your data about total food energy requirements for the group.

c) Graph the linear relation.

d) Develop a problem based on your graph that also includes interpolation and extrapolation and provide a solution. Show your work.

Waterton Park, Alberta

6] a)

Term # (x)	Value (y)
0	2
1	-2
2	-6
3	-10
4	-14
5	-18

1/2 ✓

b) $m = \dfrac{(y_2 - y_1)}{(x_2 - x_1)}$ ✓

$= \dfrac{(-18 - -2)}{(5 - 1)}$ ✓

$= \dfrac{-16}{4}$

$= -4$ ✓

6/6

$\dfrac{b}{x = 0, \ y = 2}$ ✓

$y = mx + b$ ✓

$\boxed{y = -4x + 2}$ ✓

c) $y = -4x + 2$

$= -4(11) + 2$ ✓

1/2

$= -44 + 2$

$\boxed{y = -42}$ ✓

8] a)

x	y
0	6
1	4
2	2
3	0
4	-2

1/2

b)

x	y
0	-6
1	-4
2	-2
3	0
4	2

1/2

c)

x	y
0	6
1	6
2	6
3	6
4	6

2.

9) Similar - All three produce linear graphs. ✓

Different - "a" is a decreasing line, "b" is an increasing line and "c" is constant (unchanging). ✓

2.

10) a)

Trail (t) ✓	Distance (Total) (d) ✓
1	8
2	10
3	12
4	14
5	16

2.

b) $m = \dfrac{(y_2 - y_1)}{(x_2 - x_1)}$ ✓

$= \dfrac{(16 - 8)}{(5 - 1)}$ ✓

$= \dfrac{8}{4}$

$= 2$ ✓

b $x = 0$ $b = 6$ ✓

$y = mx + b$ ✓

$y = 2x + 6$ ✓

d) $y = 2x + 6$

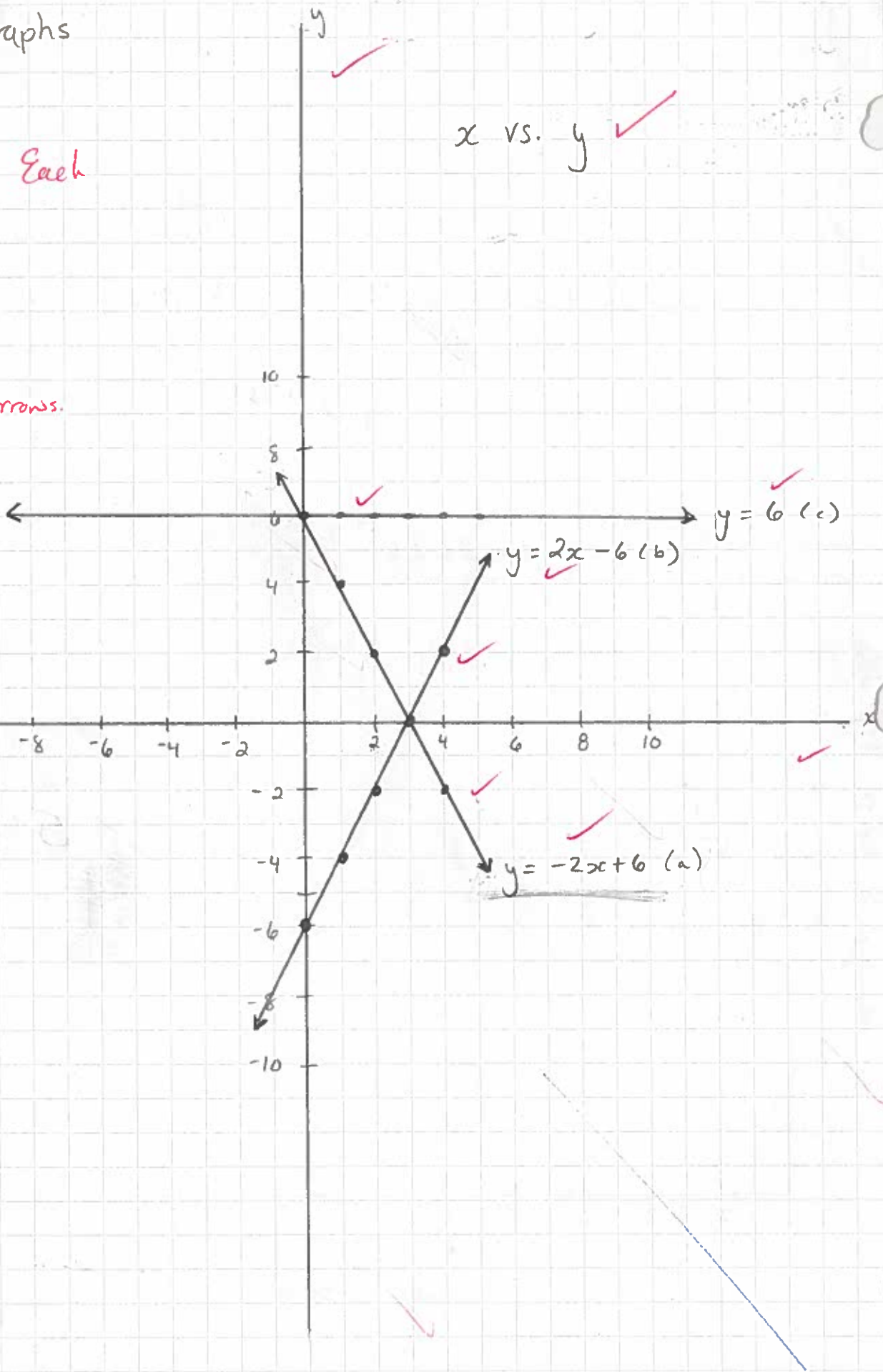$= 2(6) + 6$

$= 12 + 6$

$= 18 \text{ km}$ ✓

2.

5 Each

Title
x - axis
y - axis
Points
Connected/Arrows.

x vs. y ✓

$y = 6$ (c)

$y = 2x - 6$ (b)

$y = -2x + 6$ (a)

Relationship between trail number and distance.

either.

$$d = 2t + 6$$

No line

5

d (vertical axis)

Distance of trail (km)

20
18
16
14
12
10
8
6
4
2

2   4   6   8   10   **t**

Trail Number