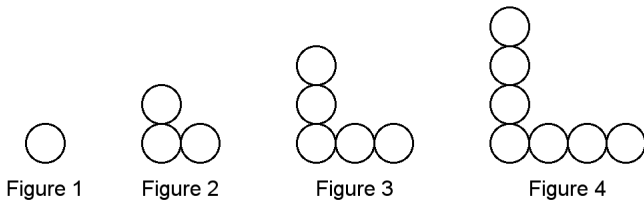


Unit 4 Linear Relations Practice Test

Multiple Choice

Identify the choice that best completes the statement or answers the question.

- _____ 1. The cost to rent a piece of equipment is \$27, plus \$6.27 per hour.
Calculate the cost of renting the equipment for 7 h.
a. \$40.27 b. \$70.89 c. \$1185.03 d. \$232.89
- _____ 2. Determine an equation that relates the number of circles, C , to the figure number, n .



- a. $C = 2n - 1$ b. $C = n \times n - 1$ c. $C = 2n + 1$ d. $C = n + 1$
- _____ 3. Sean cycles at an average speed of 3 m/s.
He travels a distance, d metres, in t seconds.
Write an equation that relates d and t .
- a. $d = t + 3$ b. $d = 3t$ c. $d = \frac{t}{3}$ d. $t = 3d$
- _____ 4. For the equation $5x - 2y = 10$, make a table of values for $x = -2, 0$, and 2 .

a.

x	-2	0	2
y	0	-5	10

c.

x	-2	0	2
y	-10	-5	0

b.

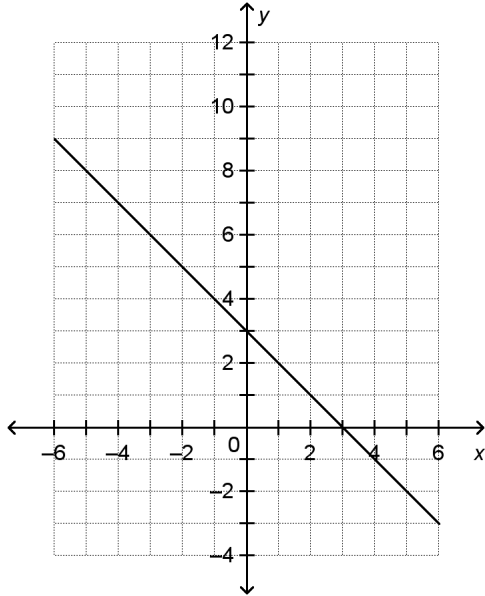
x	-2	0	2
y	10	5	1

d.

x	-2	0	2
y	-10	0	1

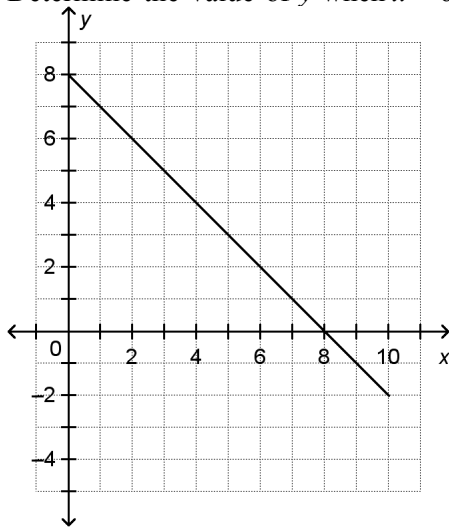
- _____ 5. Which equation describes a horizontal line?
i) $x + 7 = 2$
ii) $y + x = 7$
iii) $y - x = 0$
iv) $y + 2 = 7$
a. iii b. ii c. iv d. i

- _____ 6. Which equation describes the graph?
- i) $x + y = 3$
 - ii) $x - y = 3$
 - iii) $y - x = 3$
 - iv) $x + y = -3$



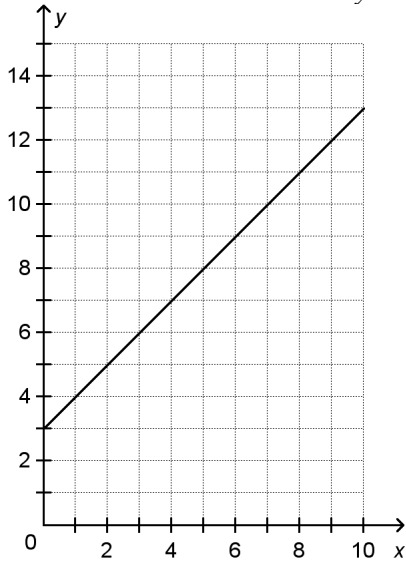
- a. iii
- b. ii
- c. iv
- d. i

- _____ 7. This graph represents a linear relation. Determine the value of y when $x = 6$.



- a. 14
- b. 2
- c. 8
- d. 0

8. This graph represents a linear relation.
Determine the value of x when $y = 5$.



- a. 3 b. 2 c. 5 d. 8

Short Answer

9. This pattern of unit squares continues.
Determine an equation that relates the number of unit squares, n , to the figure number, f .

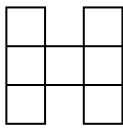


Figure 1

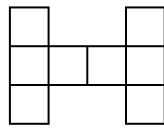


Figure 2

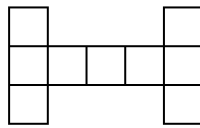


Figure 3

10. The pattern in this table continues. Write an equation that relates the term value to the term number.

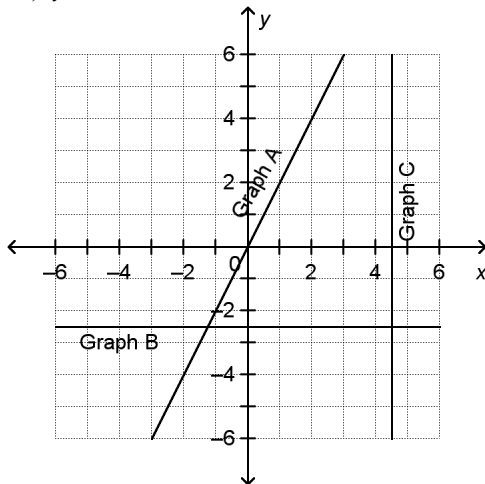
Term Number, t	1	2	3	4	5
Term Value, w	5	8	11	14	17

11. Shirley has \$550 in her bank account. She withdraws \$55 each week to cover her expenses.
a) Write an equation that relates the amount of money in her account, A dollars, after n weeks.
b) Determine the amount of money in Shirley's account after 7 weeks.

12. This table shows the perimeters and areas of squares with different side lengths.

Side Length, n (cm)	1	2	3	4	5
Perimeter, P (cm)	4	8	12	16	20
Area, A (cm ²)	1	4	9	16	25

- a) Write an equation that relates the perimeter, P , to the side length, n .
b) Write an equation that relates the area, A , to the side length, n .
c) Determine the perimeter and the area of a square with side length 16 cm.
13. Match each equation with a graph on the grid below.
- i) $2x = 9$
ii) $2y = -5$
iii) $y = 2x$



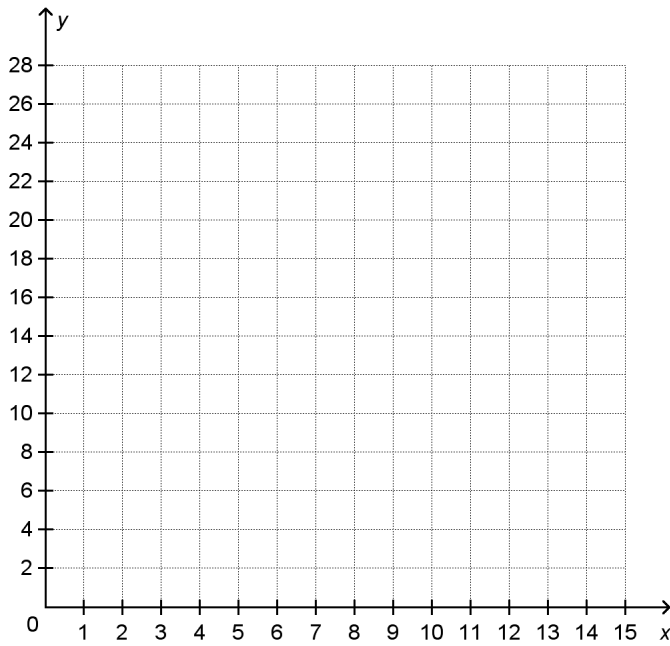
Name: _____

ID: A

Problem

14. a) Create a table of values for the relation $y = 0.5x + 2$, then graph the relation.
Use 0, 2, 4, 6, 8, 10 as values of x .

x	0	2	4	6	8	10
y						



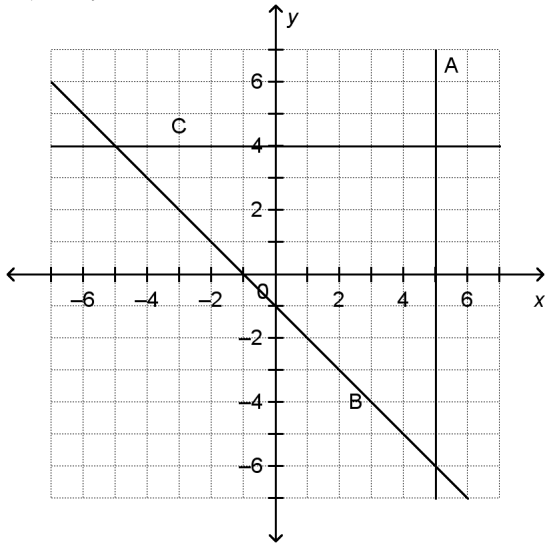
- b) Is the relation linear? How do you know?
c) What is the value of y when $x = 28$?

Name: _____

ID: A

15. Match each equation with a graph on the grid below. Justify your answer.

- i) $x = 5$
- ii) $y = 4$
- iii) $x + y = -1$



Unit 4 Linear Relations Practice Test Answer Section

MULTIPLE CHOICE

1. ANS: B PTS: 1 DIF: Moderate
REF: 4.1 Writing Equations to Describe Patterns LOC: 9.PR1
TOP: Patterns and Relations (Patterns) KEY: Procedural Knowledge
2. ANS: A PTS: 1 DIF: Easy
REF: 4.1 Writing Equations to Describe Patterns LOC: 9.PR1
TOP: Patterns and Relations (Patterns) KEY: Conceptual Understanding
3. ANS: B PTS: 1 DIF: Moderate REF: 4.2 Linear Relations
LOC: 9.PR2 TOP: Patterns and Relations (Patterns) KEY: Conceptual Understanding
4. ANS: C PTS: 1 DIF: Easy
REF: 4.3 Another Form of the Equation for a Linear Relation
LOC: 9.PR1 TOP: Patterns and Relations (Patterns) KEY: Procedural Knowledge
5. ANS: C PTS: 1 DIF: Moderate
REF: 4.3 Another Form of the Equation for a Linear Relation
LOC: 9.PR1 TOP: Patterns and Relations (Patterns) KEY: Conceptual Understanding
6. ANS: D PTS: 1 DIF: Moderate
REF: 4.3 Another Form of the Equation for a Linear Relation
LOC: 9.PR1 TOP: Patterns and Relations (Patterns) KEY: Procedural Knowledge
7. ANS: B PTS: 1 DIF: Easy
REF: 4.5 Using Graphs to Estimate Values LOC: 9.PR2
TOP: Patterns and Relations (Patterns) KEY: Procedural Knowledge
8. ANS: B PTS: 1 DIF: Easy
REF: 4.5 Using Graphs to Estimate Values LOC: 9.PR2
TOP: Patterns and Relations (Patterns) KEY: Procedural Knowledge

SHORT ANSWER

9. ANS:
 $n = 6 + f$

PTS: 1 DIF: Moderate REF: 4.1 Writing Equations to Describe Patterns
LOC: 9.PR1 TOP: Patterns and Relations (Patterns) KEY: Conceptual Understanding
10. ANS:
 $w = 3t + 2$

PTS: 1 DIF: Moderate REF: 4.1 Writing Equations to Describe Patterns
LOC: 9.PR1 TOP: Patterns and Relations (Patterns) KEY: Conceptual Understanding

11. ANS:

a) $A = 550 - 55n$

b) \$165

PTS: 1

DIF: Moderate

REF: 4.1 Writing Equations to Describe Patterns

LOC: 9.PR1

TOP: Patterns and Relations (Patterns)

KEY: Conceptual Understanding | Procedural Knowledge

12. ANS:

a) $P = 4n$

b) $A = n^2$

c) Perimeter: 64 cm

Area: 256 cm²

PTS: 1

DIF: Moderate

REF: 4.1 Writing Equations to Describe Patterns

LOC: 9.PR1

TOP: Patterns and Relations (Patterns)

KEY: Conceptual Understanding | Procedural Knowledge

13. ANS:

Graph A: $y = 2x$

Graph B: $2y = -5$

Graph C: $2x = 9$

PTS: 1

DIF: Moderate

REF: 4.4 Matching Equations and Graphs

LOC: 9.PR2

TOP: Patterns and Relations (Patterns)

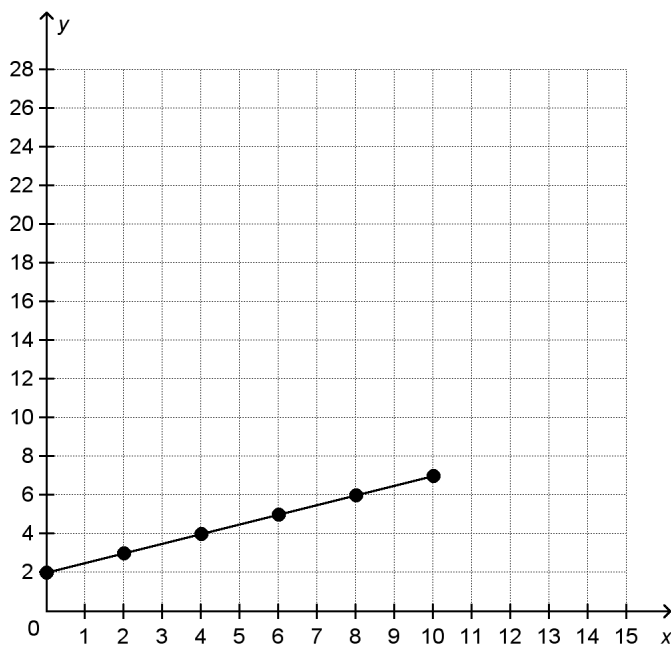
KEY: Procedural Knowledge

PROBLEM

14. ANS:

a)

x	0	2	4	6	8	10
y	2	3	4	5	6	7



b) The relation is linear because the points on the graph lie on a straight line.

c) When $x = 28$, $y = 16$.

PTS: 1 DIF: Moderate REF: 4.2 Linear Relations

LOC: 9.PR2 TOP: Patterns and Relations (Patterns)

KEY: Procedural Knowledge | Communication

15. ANS:

The graph of $x = 5$ is a vertical line. Graph A is the only vertical line, so the equation must be $x = 5$.

The graph of $y = 4$ is a horizontal line. Graph C is the only horizontal line, so the equation must be $y = 4$.

The remaining line, $x + y = -1$, has to be Graph B.

PTS: 1 DIF: Moderate REF: 4.4 Matching Equations and Graphs

LOC: 9.PR2 TOP: Patterns and Relations (Patterns)

KEY: Problem-Solving Skills | Communication