

## North & South Esk Regional

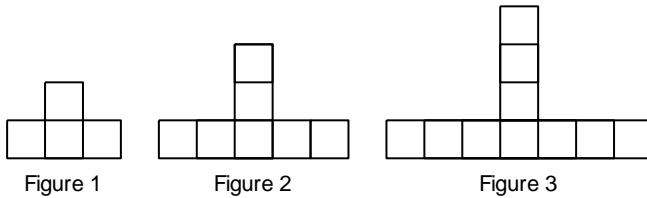
### Linear Relations Quiz #1 K Glynn/F Wilson

**Name:**  
**Date:**

#### Multiple Choice

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

- \_\_\_\_\_ 1. In the equation  $P = 7n + 6$ , determine the value of  $P$  when  $n = 9$ .  
 a. 69                      b. 22                      c. 105                      d. 96
- \_\_\_\_\_ 2. This pattern of unit squares continues. Which equation below relates the number of squares,  $n$ , to the figure number,  $f$ ?



- i)  $n = 3f + 4$
- ii)  $n = 3f + 1$
- iii)  $f = 3n + 1$
- iv)  $f = 4 + 3n$

- a. iii                      b. ii                      c. iv                      d. i
- \_\_\_\_\_ 3. The pattern in this table continues. Determine an equation that relates the term value to the term number.

<b>Term Number, <math>s</math></b>	1	2	3	4	5
<b>Term Value, <math>w</math></b>	6	10	14	18	22

- a.  $w = 4s + 2$                       b.  $w = 6s$                       c.  $w = 3s + 2$                       d.  $w = 2s + 4$

#### Short Answer

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

<b>Term Number, <math>t</math></b>	1	2	3	4	5
<b>Term Value, <math>w</math></b>	5	8	11	14	17

5. Shirley has \$540 in her bank account. She withdraws \$35 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 8 weeks.

**Problem**

6. A phone company charges a fixed cost of \$2.35 per month, plus \$0.53 per minute for local calls and \$1.07 per minute for long distance calls.
  - a) Write an equation that relates the total monthly cost,  $B$  dollars, to the local calls,  $p$  minutes, and long distance calls,  $q$  minutes.
  - b) Determine the phone bill for a month in which 53 min of local calls and 31 min of long distance calls were made.
7. A balloon is floating at a height of 10 000 m. It starts to descend at a steady rate. This table shows the height of the balloon every minute after it begins its descent.

<b>Time (<math>t</math> min)</b>	0	1	2	3	4
<b>Height (<math>h</math> m)</b>	10 000	9700	9400	9100	8800

- a) Write an equation that relates the height of the balloon,  $h$ , to the time since it started its descent,  $t$ . Describe the pattern.
- b) What is the height of the balloon after 9 min?
- c) How long after starting its descent does the balloon touch ground?

## Linear Relations Quiz 2017

### Answer Section

#### MULTIPLE CHOICE

1. ANS: A                    PTS: 1                    DIF: Easy  
REF: 4.1 Writing Equations to Describe Patterns                    LOC: 9.PR1  
TOP: Patterns and Relations (Patterns)                    KEY: Procedural Knowledge
2. ANS: B                    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: A                    PTS: 1                    DIF: Easy  
REF: 4.1 Writing Equations to Describe Patterns                    LOC: 9.PR1  
TOP: Patterns and Relations (Patterns)                    KEY: Conceptual Understanding
4. ANS: B                    PTS: 1                    DIF: Easy                    REF: 4.2 Linear Relations  
LOC: 9.PR2                    TOP: Patterns and Relations (Patterns)                    KEY: Conceptual Understanding
5. ANS: A                    PTS: 1                    DIF: Moderate                    REF: 4.2 Linear Relations  
LOC: 9.PR2                    TOP: Patterns and Relations (Patterns)                    KEY: Procedural Knowledge
6. ANS: B                    PTS: 1                    DIF: Moderate                    REF: 4.2 Linear Relations  
LOC: 9.PR2                    TOP: Patterns and Relations (Patterns)                    KEY: Procedural Knowledge
7. ANS: A                    PTS: 1                    DIF: Moderate                    REF: 4.2 Linear Relations  
LOC: 9.PR2                    TOP: Patterns and Relations (Patterns)                    KEY: Procedural Knowledge

#### SHORT ANSWER

8. 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
9. ANS:  
a)  $A = 540 - 35n$   
b) \$260  
  
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
10. ANS:  
a) ii  
b)  $y = 15 - 4x$   
  
PTS: 1                    DIF: Moderate                    REF: 4.2 Linear Relations  
LOC: 9.PR2                    TOP: Patterns and Relations (Patterns)  
KEY: Conceptual Understanding | Procedural Knowledge
11. ANS:  
a)

x	2	3	4	5	6
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y	13	16	19	22	25
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b)  $y = 3x + 7$

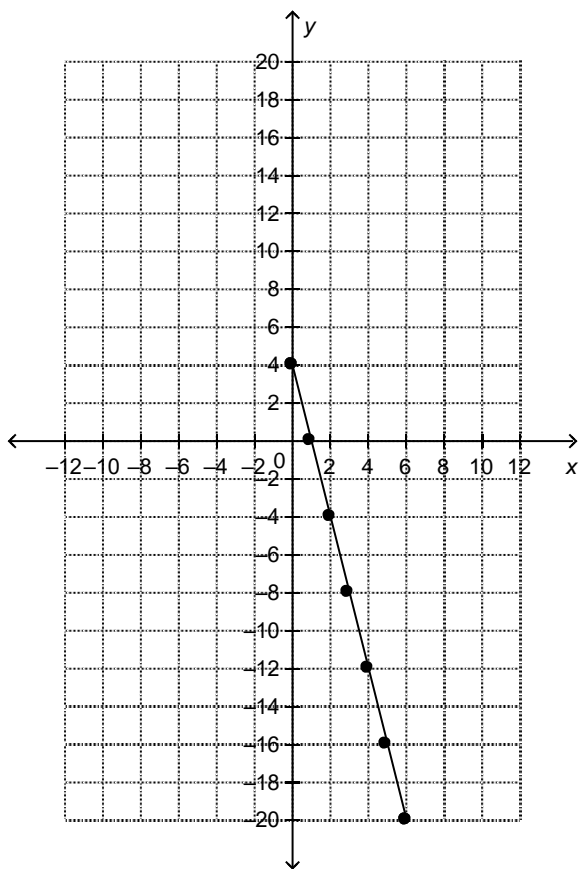
PTS: 1                      DIF: Moderate              REF: 4.2 Linear Relations

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

KEY: Conceptual Understanding | Procedural Knowledge

12. ANS:

x	0	1	2	3	4	5	6
y	4	0	-4	-8	-12	-16	-20



PTS: 1                      DIF: Moderate              REF: 4.2 Linear Relations

LOC: 9.PR2                      TOP: Patterns and Relations (Patterns)              KEY: Procedural Knowledge

**PROBLEM**

13. ANS:

a)  $B = 2.35 + 0.53p + 1.07q$

b)  $B = 2.35 + 0.53(53) + 1.07(31) = 63.61$

The phone bill for that month is \$63.61.

PTS: 1                      DIF: Difficult                      REF: 4.1 Writing Equations to Describe Patterns  
 LOC: 9.PR1                      TOP: Patterns and Relations (Patterns)                      KEY: Problem-Solving Skills

14. ANS:

a)  $h = 10\,000 - 300t$

When  $t$  increases by 1,  $h$  decreases by 300.

b) Substitute  $t = 9$  into the equation  $h = 10\,000 - 300t$ .

$$h = 10\,000 - 300(9)$$

$$= 7300$$

The height of the balloon after 9 min is 7300 m.

c) Substitute  $h = 0$  into the equation  $h = 10\,000 - 300t$ .

$$0 = 10\,000 - 300t$$

$$300t = 10\,000$$

$$t = \frac{10\,000}{300}$$

$$\approx 33$$

The balloon touches ground approximately 33 min after starting its descent.

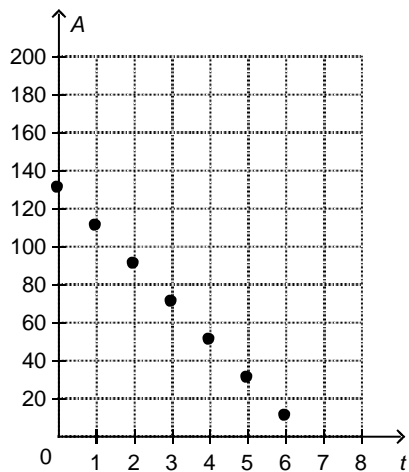
PTS: 1                      DIF: Difficult                      REF: 4.1 Writing Equations to Describe Patterns  
 LOC: 9.PR1                      TOP: Patterns and Relations (Patterns)  
 KEY: Problem-Solving Skills | Communication

15. ANS:

a)  $A = 130 - 20t$

b)

$t$	0	1	2	3	4	5	6
$A$	130	110	90	70	50	30	10



I will not join the points because the data are discrete.

c) Geoffrey will have \$50.00 in his account after 4 weeks.

PTS: 1                      DIF: Difficult                      REF: 4.2 Linear Relations  
 LOC: 9.PR2                      TOP: Patterns and Relations (Patterns)  
 KEY: Problem-Solving Skills | Communication