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## Chapter 1 Test – Expressions, Equations, and Functions

Student Name		Class		Date	
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### Multiple Choice: CALCULATOR NOT ALLOWED

1	A ___ (1) ___ is a symbol used to represent unspecified numbers or values. Along with a number or a product or quotient of numbers, it can be found in a ___ (2) ___ of an ___ (3) ___.	
	A	(1) variable (2) product (3) exponent
	B	(1) factor (2) product (3) exponent
	C	(1) variable (2) term (3) expression
	D	(1) factor (2) term (3) expression

2	Write an algebraic expression for the verbal expression.  <i>eight to the fourth power increased by the product of six and the square of a number</i>	
	A	$8(4) + 6x^2$
	B	$8^4 + 6x$
	C	$8(4) + 6x$
	D	$8^4 + 6x^2$

3	Simplify the expression.  $62 - 3^2 \cdot 8 + 11$	
	A	-109
	B	-21
	C	1
	D	435



## Chapter 1 Test – Expressions, Equations, and Functions

4	Evaluate $a(4b + c^2)$ if $a = -2$ , $b = 5$ , and $c = -11$ .	
	A	-282
	B	-84
	C	4
D	136	

5	The _____ of a term is the numerical factor.	
	A	reciprocal
	B	coefficient
	C	product
D	base	

6	Use the Distributive Property to rewrite and simplify the expression.	
	$16a^2 - 2b(7b + 3) - 2a^2$	
	A	$18a^2 - 8b$
	B	$14a^2 - 14b^2 + 6b$
	C	$18a^2 - 20b$
D	$14a^2 - 14b^2 - 6b$	

7	What is the solution of the equation?	
	$9t - 4 + 1 = -3(t + 1 - 4t)$	
	A	identity
	B	no solution
	C	$-\frac{1}{3}$
D	0	



## Chapter 1 Test – Expressions, Equations, and Functions

8	Which correctly shows the relation represented by the table using ordered pairs?													
	<table border="1" style="margin: auto;"> <thead> <tr> <th style="background-color: #4a7ebb; color: white;">x</th> <th style="background-color: #4a7ebb; color: white;">y</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">-4</td> <td style="text-align: center;">6</td> </tr> <tr> <td style="text-align: center;">1</td> <td style="text-align: center;">3</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">4</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">5</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">8</td> </tr> </tbody> </table>	x	y	-4	6	1	3	2	4	3	5	3	8	
	x	y												
	-4	6												
	1	3												
2	4													
3	5													
3	8													
<b>A</b>	{(5, 3), (6, -4), (8, 3), (4, 2), (3, 1)}													
<b>B</b>	{{(-4, 1), (2, 3), (3, 6), (3, 4), (5, 8)}													
<b>C</b>	{{(3, 5), (-4, 6), (3, 8), (2, 4), (1, 3)}													
<b>D</b>	{{(6, 3), (4, 5), (8, -4), (1, 2), (3, 3)}													

9	The variable with a value that determines the output of a relation is called the <u>  (1)  </u> variable. The domain contains values of this variable, whereas the range contains the values of the <u>  (2)  </u> variable.	
	<b>A</b>	(1) dependent (2) independent
	<b>B</b>	(1) unknown (2) known
	<b>C</b>	(1) independent (2) dependent
	<b>D</b>	(1) known (2) unknown

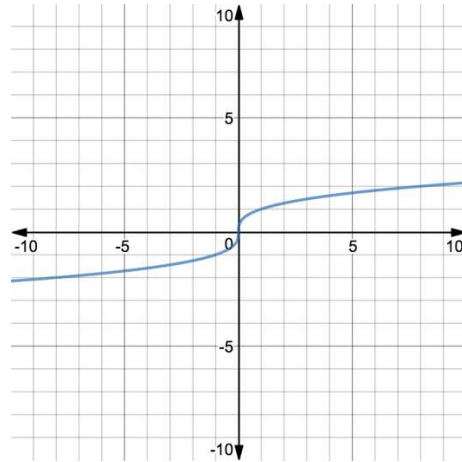
10	Let the domain of $f(x) = -1.5x + 4$ be $\{1, 2, 3, 4\}$ . What is the range?	
	<b>A</b>	$\{-2, -0.5, 1, 2.5\}$
	<b>B</b>	$\{-2.5, -1, 0.5, 2\}$
	<b>C</b>	$\{-2, -1, -0.5, 2.5\}$
	<b>D</b>	$\{-2.5, -0.5, 1, 2\}$



## Chapter 1 Test – Expressions, Equations, and Functions

11

Ahmed used the vertical line test and concluded that the partial graph shown below represents a function. Is he correct? Why or why not?



- |          |  |
|----------|--|
| <b>A</b> | No; the line will intersect the graph at one point.            |
| <b>B</b> | Yes; the line will intersect the graph at one point.           |
| <b>C</b> | No; the line will intersect the graph in more than one point.  |
| <b>D</b> | Yes; the line will intersect the graph in more than one point. |

12

A function is   (1)   where its graph lies above the  $x$ -axis and   (2)   where the graph lies below the  $x$ -axis.

- |          |                                  |
|----------|----------------------------------|
| <b>A</b> | (1) increasing<br>(2) decreasing |
| <b>B</b> | (1) negative<br>(2) positive     |
| <b>C</b> | (1) decreasing<br>(2) increasing |
| <b>D</b> | (1) positive<br>(2) negative     |



## Chapter 1 Test – Expressions, Equations, and Functions

### Constructed Response: CALCULATOR ALLOWED

13

$$3^2 + \left[ (12 - 2 \cdot 7) - \frac{11 + 5}{4} \right]$$

$$9 + \left[ (10 \cdot 7) - \frac{16}{4} \right]$$

$$9 + (70 - 4)$$

$$9 + 66$$

$$75$$

a) What mistake did the student make in simplifying the expression above? ( /1 mark)

\_\_\_\_\_

\_\_\_\_\_

b) What is the correct, simplified form of the expression? ( /1 mark)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

14

For the steps shown below, use the word bank below to name the property used to justify each step.

$$-5 \cdot 4 + \left( \frac{1}{7} \cdot 7 - 1 \right)$$

$$-5 \cdot 4 + (1 - 1) \quad \underline{\hspace{2cm}} \quad (1) \quad ( /1 \text{ mark})$$

$$-5 \cdot 4 + (0) \quad \underline{\hspace{2cm}} \quad (2) \quad ( /1 \text{ mark})$$

$$-20 + 0 \quad \underline{\hspace{2cm}} \quad (3) \quad ( /1 \text{ mark})$$

$$-20 \quad \underline{\hspace{2cm}} \quad (4) \quad ( /1 \text{ mark})$$

**Word Bank**

Additive Identity

Additive Inverse

Multiplicative Identity

Multiplicative Property of Zero

Multiplicative Inverse

Substitution Property

15

Simplify the expression. If it is not possible, write *simplified*.

$$-4p + 3n + 11m$$

\_\_\_\_\_ ( /1 mark)

16

Aisha is typing an average of 40 words per minute.

a) Write an equation to find the time, in minutes, it will take her to type 1000 words. ( /1 mark)

\_\_\_\_\_

b) Solve the equation. ( /1 mark)

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ ( /1 mark)



## Chapter 1 Test – Expressions, Equations, and Functions

17

Describe the graph of the price of one share of a company's stock shown below.



\_\_\_\_\_ ( /1 mark)

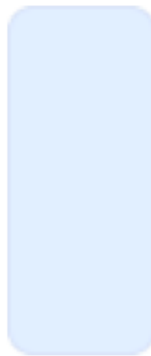
\_\_\_\_\_

18

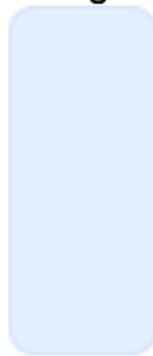
Use the relation  $\{(-2, 5), (-1, 3), (0, -1), (1, 2)\}$  to do the following:

- Identify the domain of the relation.  
\_\_\_\_\_ ( /1 mark)
- Identify the range of the relation.  
\_\_\_\_\_ ( /1 mark)
- Represent the relation with a mapping diagram.

Domain



Range



( /1 mark)

Multiple Choice	/12
Constructed Response	/13
Total Marks	/25
Percentage	/100%



## Chapter 1 Test – Expressions, Equations, and Functions

Grade	8	Lesson(s)	<b>Lesson 1-1:</b> Variables and Expressions <b>Lesson 1-2:</b> Order of Operations <b>Lesson 1-3:</b> Properties of Numbers <b>Lesson 1-4:</b> The Distributive Property <b>Lesson 1-5:</b> Equations <b>Lesson 1-6:</b> Relations <b>Lesson 1-7:</b> Functions <b>Lesson 1-8:</b> Interpreting Graphs of Functions
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## Chapter 1 Test – Expressions, Equations, and Functions

# Answer Key

### Multiple Choice

Q1	C
Q2	D
Q3	C
Q4	A
Q5	B
Q6	D
Q7	A
Q8	C
Q9	C
Q10	A
Q11	B
Q12	D

### Constructed Response

13	<p>a) The student subtracted 2 from 12 before multiplying 2 by 7.</p> <p>b)</p> $3^2 + \left[ (12 - 2 \cdot 7) - \frac{11+5}{4} \right]$ $9 + \left[ (12 - 14) - \frac{16}{4} \right]$ $9 + (-2 - 4)$ $9 + (-6)$ $3$	2 marks
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14	<p>(1) Multiplicative Inverse (2) Additive Inverse (3) Substitution Property (4) Additive Identity</p>	4 marks
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15	simplified	1 mark
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16	<p>a) <math>40x = 1000</math> or <math>x = \frac{1000}{40}</math></p> <p>b) 25 minutes (not awarding marks for the unit)</p>	2 marks
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## Chapter 1 Test – Expressions, Equations, and Functions

17

The price increased more in the afternoon than in the morning.

**OR**

The stock is positive and increasing over time.

**OR**

In the morning, the price was almost constant until noon. Then there was a rapid increase from noon to the evening.

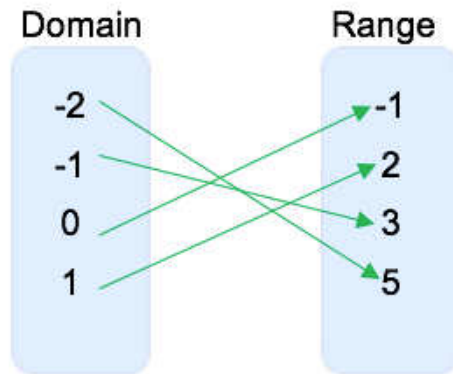
(Please use your professional judgment to make sure the student's response coincides with the graph.)

1 mark

18

a) domain:  $\{-2, -1, 0, 1\}$

b) range:  $\{-1, 2, 3, 5\}$



c)

Please note that if the student maps a value in the domain to the correct value in the range without placing them in ascending order, the mark should be awarded.

3 marks