

## MAT 0012 BASIC ALGEBRA I

### COMPREHENSIVE REVIEW

**PART I – MULTIPLE CHOICE:** Choose the correct answer for each question.

1) **Insert <, >, or = to write a true statement:**

$$-|-13| \quad \underline{\hspace{1cm}} \quad -(-13)$$

- A) >      B) <      C) =

**Evaluate each expression.**

2)  $(-1)^{12}$

- A) -12                      B) 1  
C) -1                        D) 12

3)  $-3^4$

- A) 12                        B) -12  
C) -81                      D) 81

**Simplify each expression.**

4)  $5 \cdot 6 + 2(8 - 6) + 4$

- A) 38                        B) 44  
C) 84                        D) 42

5)  $17 - (-6)^2$

- A) -19                      B) 53  
C) 29                        D) 19

6)  $\frac{-6 - 27}{-3}$

- A) -3                        B) -7  
C) -11                      D) 11

7) **Find the prime factorization:** 350.

- A)  $2 \cdot 5 \cdot 5 \cdot 7$             B)  $2 \cdot 5 \cdot 7$   
C)  $2 \cdot 2 \cdot 5 \cdot 5 \cdot 7$         D)  $14 \cdot 5 \cdot 5$

8) **Write the fraction in lowest terms:**  $\frac{28}{-36}$

- A)  $\frac{7}{9}$                         B)  $-\frac{7}{9}$   
C)  $-\frac{28}{36}$                     D)  $-\frac{4}{9}$

9) **Find the LCD of the given set of fractions:**

$$\frac{3}{10}, \frac{5}{6}, \frac{4}{15}$$

- A) 6                        B) 15  
C) 30                      D) 10

10) **Write as an equivalent fraction with the given denominator:**

$$\frac{13}{16} = \frac{?}{96}$$

- A)  $\frac{208}{96}$                       B)  $\frac{13}{96}$   
C)  $\frac{78}{96}$                       D)  $\frac{78}{96}$

11) Write  $5\frac{3}{8}$  as an improper fraction.

- A)  $\frac{43}{8}$                         B)  $\frac{40}{8}$   
C)  $\frac{43}{3}$                         D)  $\frac{40}{3}$

12) Write  $\frac{36}{8}$  as a mixed number.

- A)  $4\frac{4}{8}$                         B)  $4\frac{1}{2}$   
C)  $2\frac{1}{4}$                         D)  $5\frac{1}{2}$



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**Solve each equation.**

29)  $12 - 4x - 8 = -5x$

- A) 20                                      B) 4  
C) -4                                        D) -20

30)  $-7(x - 3) = -42$

- A) 3    B) 9  
C) -9                                        D) -3

31)  $h + \frac{1}{6} = \frac{3}{4}$

- A)  $\frac{7}{12}$                                         B)  $\frac{11}{12}$   
C) 7    D)  $\frac{9}{2}$

32)  $-\frac{3}{5}x = -\frac{4}{9}$

- A)  $\frac{20}{27}$                                         B)  $-\frac{20}{27}$   
C)  $-\frac{7}{45}$                                         D)  $\frac{7}{45}$

33) **Translate into an algebraic expression:**

Twelve less than ten times a number

- A)  $12 - 10x$                                 B)  $10x - 12$   
C)  $12 - (10 + x)$                         D)  $10 - 12x$

34) When 24 is subtracted from six times a certain number, the result is 108. Find the number.

- A) -14                                        B) 14  
C) 42                                         D) 22

35) **Solve the proportion:**  $\frac{3}{13} = \frac{x}{39}$

- A) 1    B) 13  
C)  $\frac{1}{9}$                                          D) 9

36) If a spring stretches 7 meters when a 8-kilogram weight is attached to it, how much will it stretch when a 24-kilogram weight is attached to it?

- A) 21 meters                                B) 23 meters  
C) 24 meters                                D) 20 meters

37) Write 35.3% as a decimal.

- A) 0.0353                                    B) 3.53  
C) 0.353                                     D) 353

38) Write 15% as a fraction in lowest terms.

- A)  $\frac{3}{20}$                                         B)  $\frac{3}{25}$   
C)  $\frac{1}{5}$                                          D)  $\frac{3}{5}$

39) Write 0.875 as a percent.

- A) 87.5%                                    B) 8.75%  
C) 87%                                      D) 875%

40) Write  $\frac{4}{25}$  as a percent.

- A) 0.16%                                    B) 16%  
C) 6.25%                                    D) 625%

41) 18 is what percent of 45?

- A) 2.5%                                      B) 4%  
C) 40%                                      D) 25%

42) **Find the square root:**  $\sqrt{81}$

- A) 3    B)  $\sqrt{3}$   
C) 27                                         D) 9

43) Determine whether the given ordered pair is a solution of the given equation:

$4x + 2y = -2$                             (-2, 3)

- A) No                                         B) Yes

# MAT 0012 BASIC ALGEBRA I – COMPREHENSIVE REVIEW

## PART II – WORKED PROBLEMS: Show all work where necessary.

### Simplify each expression.

- 1)  $12^2 + 7 \cdot 8 - (12 + 4 \cdot 3)$
- 2)  $4 \cdot (3 + 4)^2 - 2(5 - 3)^3$
- 3)  $-81 \div 3 + \{4 \cdot [18 - (3 \cdot 2)]\}$
- 4)  $18 - |8 - 12| \cdot 6$
- 5)  $\frac{-32 \cdot 16 \div 4^2}{6 \cdot 36 - 216}$
- 6) Subtract  $-8$  from  $-12$ .
- 7) **Simplify:**  $24 + (-18) - 13 - (-6)$
- 8) **Add:**  $\frac{5}{6} + \frac{7}{12} - \frac{4}{15}$
- 9) **Subtract:**  $-\frac{1}{8} - \left(-\frac{2}{5}\right)$
- 10) **Multiply:**  $-4(-3)(-7)(-2)$
- 11) **Divide:**  $-128 \div (-16) \div (-4)$
- 12) **Simplify:**  $14.6 \cdot \frac{9}{25} \div 0.5$
- 13) Evaluate  $2x^2 + 5x - 10$  for  $x = -3$
- 14) **Combine:**  $24x - 8y + 15 - 19x - 10 - 2y$

### Simplify each expression.

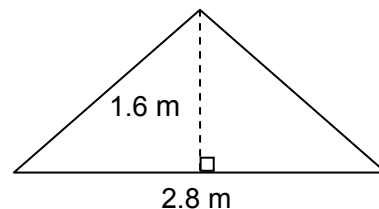
- 15)  $-8(-6x - 9y + 3)$
- 16)  $4 - 3(3 + x) - 5x$
- 17)  $-2(x + 5) - (3x - 6)$

### Solve each equation.

- 18)  $5(z - 4) = 9(z - 2)$
- 19)  $8 - 4(x + 3) = 7 - 3(x + 4)$
- 20)  $-0.06y - 0.14(50 - y) = 0.03y$
- 21)  $\frac{1}{2}r + 2 = \frac{1}{6}r + \frac{4}{3}$

### Solve each problem.

- 22) A 24-inch board is cut into two pieces so that the second piece is five times as long as the first piece. How long is each piece?
- 23) Find the length of a rectangular parking lot with a perimeter of 94 meters if the length is 5 meters more than the width.
- 24) A car rental agency rents a compact car at a daily rate of \$36.20 plus 20 cents per mile. If you rent a car for one day, how many miles can you drive on a budget of \$80?
- 25) Elaine's salary last year was \$45,000. This year she received a 5% raise. What is her current salary?
- 26) By switching service providers, a family's telephone bill decreased from \$60 a month to \$45 a month. What was the percent decrease?
- 27) Find the area of the triangle shown below.



**MAT 0012 BASIC ALGEBRA I - COMPREHENSIVE REVIEW**

28) The bar graph below shows the number of boxes of Girl Scout cookies sold by a local troop over a six-day period. Use this graph to answer the following questions.

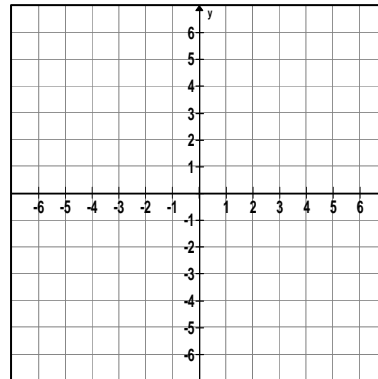


- A) How many more boxes of cookies were sold during week 4 than week 3?
- B) What was the average number of boxes sold during the six-week period? (Round the answer to the nearest whole number.)

29) Find the square root:  $\sqrt{\frac{9}{25}}$

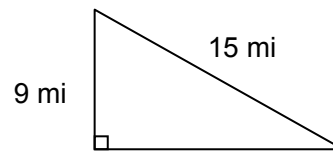
30) Plot the points corresponding to the following ordered pairs:

- A:** (-2, 5); **B:** (3, -4); **C:** (0, -3); **D:** (-4, -5)



31) Complete the ordered pair solutions for the equation  $y = -x + 5$ : (1, ), ( , 7), (3, ).

32) Find the unknown length of the right triangle.



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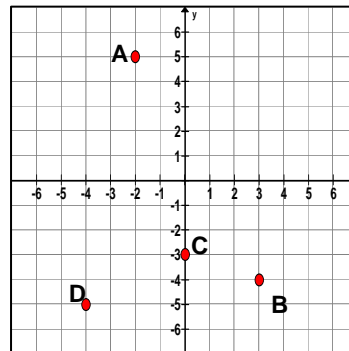
## Answer Key

### Part I – Multiple Choice

- |       |       |       |
|-------|-------|-------|
| 1) B  | 15) B | 30) B |
| 2) B  | 16) C | 31) A |
| 3) C  | 17) B | 32) A |
| 4) A  | 18) C | 33) B |
| 5) A  | 19) A | 34) D |
| 6) D  | 20) D | 35) D |
| 7) A  | 21) A | 36) A |
| 8) B  | 22) C | 37) C |
| 9) C  | 23) B | 38) A |
| 10) D | 24) A | 39) A |
| 11) A | 25) D | 40) B |
| 12) B | 26) B | 41) C |
| 13) D | 27) C | 42) D |
| 14) C | 28) B | 43) B |
|       | 29) C |       |

### Part II – Worked Problems

- |                         |                        |
|-------------------------|------------------------|
| 1) 176                  | 25) \$47,250           |
| 2) 180                  | 26) 25%                |
| 3) 21                   | 27) $2.24 \text{ m}^2$ |
| 4) -6                   | 28) A) 25 boxes        |
| 5) Undefined            | B) 27 boxes            |
| 6) -4                   | 29) $3/5$              |
| 7) -1                   | 30)                    |
| 8) $23/20$              |                        |
| 9) $11/40$              |                        |
| 10) 168                 |                        |
| 11) -2                  |                        |
| 12) 10.512              |                        |
| 13) -7                  |                        |
| 14) $5x - 10y + 5$      |                        |
| 15) $48x + 72y - 24$    |                        |
| 16) $-8x - 5$           |                        |
| 17) $-5x - 4$           |                        |
| 18) $-1/2$              |                        |
| 19) 1                   |                        |
| 20) 140                 |                        |
| 21) -2                  |                        |
| 22) 4 inches; 20 inches |                        |
| 23) 26 meters           |                        |
| 24) 219 miles           |                        |



- 31)  $(1, 4); (-2, 7); (3, 2)$   
32) 12 miles