

# Integrated Algebra 2 Practice Cumulative Evaluation A3 – Form 1

Lesson 4.1-3 (Slope of a Line) & Lesson 2.3 (Intro to Algebraic Problem Solving) + Review of Subunits A1 & A2

## GROUND RULES FOR TEST COMPLETION

1. Present your work in a neat and organized manner. Use complete sentences whenever you are asked to make a statement.
2. SHOW YOUR WORK: Partial credit will be awarded on the basis of the work shown.
3. Make sure you answer ALL parts of problems.



## Review and Extension Questions for Subunit A1:

1. [6] (1) Solve  $y: -3\left[-\frac{1}{9}y + \frac{2}{3}\right] = \frac{5}{6} + 6y$  by **isolating the variable**. (2) If there is a **unique solution, show a check of your solution**. If there is **NO solution**, or the solution is **ALL REAL Numbers**, **explain your conclusion**. **NOTE: No credit will be awarded unless work is shown.**
2. [4] Solve for  $x: 5x - 2y = 15 + 23y$
3. [4] Solve  $12 - 4b < -8$  for  $b$  and graph its **solution set** on a number line – **be sure to label all critical points**. **NOTE: No credit will be awarded unless work is shown.**
4. [2] Write a compound inequality indicating that  $M$  is more than  $-5$  but less than or equal to  $14$ .

## Review and Extension Questions for Subunit A2:

5. [6] Rewrite each expression below in simplest form using exponents.  
a.  $8^3 \cdot c \cdot 8^5 \cdot c^3$       b.  $m^{13} \div m^6$       c.  $(2p)^4$
6. [5] Completely simplify  $\left[\frac{(3^2 ab^3 * 3^4 a^2 b^5)^4}{(3^6 ab * 3^2 a^5 b^4)^3}\right]^2$ .
7. [3] Calculate the value of  $(2^3 x^0) + \frac{6^2}{(3 y^0)^1}$ .
8. [6] Use **either substitution or elimination** to solve this system. **Show a check of your solution**. **NOTE: No credit will be awarded unless work is shown.**  
$$y = 5x + 9$$
$$-2x - 6y = 10$$
9. [6] Use **either substitution or elimination** to solve this system. **Show a check of your solution**. **NOTE: No credit will be awarded unless work is shown.**  
$$4s + 5t = 18$$
$$-2s - 6t = -6$$

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### Questions for Subunit A3:

10. [10] Find the slopes of the following lines:

- A horizontal line
- A vertical line.
- The line through the points (12, 5) and (−4, −8)
- A line parallel to the line that passes through the points (0, −6) and (−10, 3).
- A line perpendicular to the line that passes through the points (−2, 7) and (6, 11).

**Use graph paper to answer questions 11 - 13. You may use the same set of axes for all 3 graphs. Be sure to label each line as well as points on each axis to indicate the scale you used.**

11. [3] Graph the equation  $x = -4$ .

12. [3] Graph the equation  $y = 7$ .

13. [4] The point (3, −8) lies on a line with slope −2. Graph this line by finding another point that lies on the line.

**Answer any 6 of the remaining 7 questions. Give your answers in complete sentences.** (You may do the remaining question for extra credit.)

14. [6] The sum of two numbers is 15. Their difference is 32. What are the numbers?

15. [6] The sum of three consecutive odd integers is 123. What are the numbers?

16. [6] The measure of the largest angle in a triangle is 70 degrees more than the measure of the smallest angle and the measure of the next smallest angle is 40 degrees. What is the measure of each angle? [You may also find it helpful to use a sketch to represent the problem.]

17. [6] The longest side of a triangle is 8 cm longer than the shortest side. The remaining side is 4 inches longer than the shortest side. If the perimeter of the triangle is 45 cm, what is the length of each side? [You may also find it helpful to use a sketch to represent the problem.]

18. [6] The width of a rectangle is 9 inches less than twice its length. If the perimeter of the rectangle is 78 inches, what are its dimensions? [You may also find it helpful to use a sketch to represent the problem.]

19. [6] The perimeter of a square is three times the perimeter of a regular hexagon. If the length of a side of the square is 2 feet more than twice the length of a side of the hexagon, what is the perimeter of each figure? [You may also find it helpful to use a sketch to represent the problem.]

20. [6] The length of a rectangular dog run is three times its width. If the perimeter is 240 feet, what is the area of the dog run? [You may also find it helpful to use a sketch to represent the problem.]

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### ANSWER KEY with SOLUTIONS TO SELECTED PROBLEMS

#### Review and Extension Questions for Subunit A1:

1. [6]  $\frac{1}{3}y + -2 = \frac{5}{6} + 6y \rightarrow 6[\frac{1}{3}y + -2] = [\frac{5}{6} + 6y]6 \rightarrow 2y + -12 = 5 + 36y \rightarrow y = \frac{-1}{2}$

2. [4]  $x = 3 + 5y$

3. [4]  $-4b < -20 \rightarrow b > 5$



4. [2]  $-5 < M \leq 14$

#### Review and Extension Questions for Subunit A2:

5. [6] a.  $8^8 \cdot c^4$  b.  $m^7$  c.  $2^4 p^4$  or  $16p^4$

6. [5]  $\left[\frac{(3^6 a^3 b^8)^4}{(3^8 a^6 b^5)^3}\right]^2 \rightarrow \left[\frac{(3^{24} a^{12} b^{32})}{(3^{24} a^{18} b^{15})}\right]^2 \rightarrow \left[\frac{b^{17}}{a^6}\right]^2 \rightarrow \frac{b^{34}}{a^{12}}$

7. [3] 20

8. [6]  $-2x - 6(5x + 9) = 10 \rightarrow -2x - 30x - 54 = 10 \rightarrow -32x = 64 \rightarrow x = -2$

$y = 5(-2) + 9 \rightarrow y = -1$

Check: 1)  $-1 = ? 5(-2) + 9 \rightarrow -1 = -1 \checkmark$ ; 2)  $-2(-2) - 6(-1) = ? 10 \rightarrow 10 = 10 \checkmark$

9. [6]  $2[-2s - 6t] = [-6]2 \rightarrow -4s - 12t = -12$

$$\underline{4s + 5t = 18}$$

$$-\frac{7t}{-7} = \frac{6}{-7} \rightarrow t = -\frac{6}{7}$$

$$4s + 5\left(-\frac{6}{7}\right) = 18 \rightarrow 28s - 30 = 126 \rightarrow s = \frac{39}{7}$$

Check: 1)  $4\left(\frac{39}{7}\right) + 5\left(-\frac{6}{7}\right) = ? 18 \rightarrow 156 - 30 = 126 \checkmark$

2)  $-2\left(\frac{39}{7}\right) - 6\left(-\frac{6}{7}\right) = -6 \rightarrow -78 + 36 = -42 \checkmark$

#### Questions for Subunit A3:

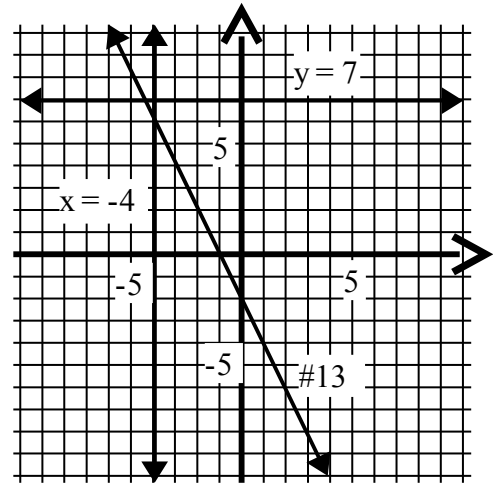
10. [10] a.  $m = 0$  b. *undefined* c.  $m = \frac{13}{16}$  d.  $m = -\frac{9}{10}$  e.  $m = -2$

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11. [3] Graph the equation  $x = -4$ .
12. [3] Graph the equation  $y = 7$ .
13. [4] The point  $(3, -8)$  lies on a line with slope  $-2$ . Graph this line by finding another point that lies on the line.



**Answer any 6 of the remaining 7 questions. Give your answers in complete sentences. (You may do the remaining question for extra credit.)**

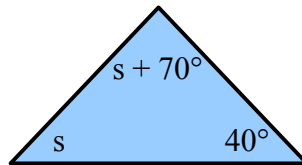
14. [6]  $L + S = 15$   
 $\frac{L - S = 32}{2L = 47} \rightarrow \boxed{L = 23.5}$  ;  $S = 15 - 23.5 \rightarrow \boxed{S = -8.5}$

Check: 1)  $23.5 + (-8.5) = ? 15 \rightarrow 15 = 15 \checkmark$ ; 2)  $23.5 - (-8.5) = ? 32 \rightarrow 32 = 32 \checkmark$

**The numbers are -8.5 and 23.5.**

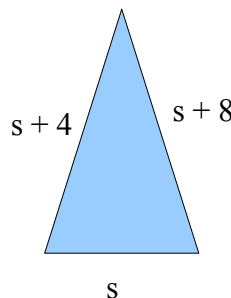
15. [6] 
$$\begin{array}{l} N \\ N + 2 \\ \underline{N + 4} \\ 3N + 6 = 123 \end{array} \rightarrow \begin{array}{l} N = 39 \\ N + 2 = 41 \\ N + 4 = \underline{43} \end{array}$$
 **The numbers are 39, 41, and 43.**  
 Check: 123

16. [6] 
$$\begin{array}{l} s + (s + 70) + 40 = 180 \\ 2s + 110 = 180 \\ s = 35 \end{array}$$



**The measures of the angles are 35°, 40°, and 105°.**

17. [6] 
$$\begin{array}{l} (s + 8) + (s + 4) + s = 45 \\ 3s + 12 = 45 \\ s = 11 \end{array}$$



**The sides are 11", 15", and 19".**

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18. [6]

$$P = 2L + 2W$$

$$W = 2L - 9$$

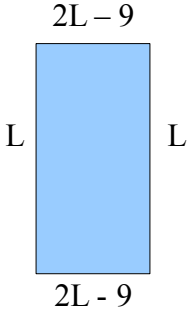
$$78 = 2L + 2(2L - 9)$$

$$78 = 6L - 18$$

$$\underline{L = 16}$$

$$W = 2(16) - 9$$

$$\underline{W = 23}$$



Check:

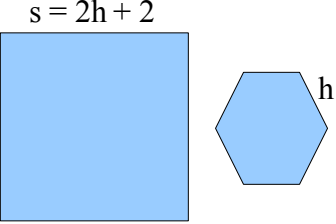
$$P = 2L + 2W$$

$$78 = 2(16) + (23)$$

$$78 = 78 \checkmark$$

**The dimensions of the rectangle are 16 inches by 23 inches.**

19. [6]



$$P_s = 3P_h$$

$$4(2h + 2) = 3(6h)$$

$$8h + 8 = 18h$$

$$10h = 8$$

$$h = 0.8$$

$$s = 2(0.8) + 2$$

$$s = 3.6$$

$$P_s = 4(3.6) = 14.4 \text{ ft}$$

$$P_h = 6(0.8) = 4.8 \text{ ft}$$

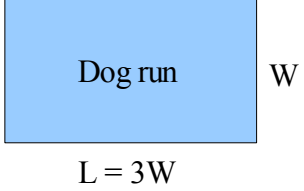
→ Check:

$$3(4.8) = ? 14.4$$

$$14.4 = 14.4 \checkmark$$

**The perimeter of the square is 14.4 feet and the perimeter of the hexagon is 4.8 feet.**

20. [6]



$$P = 2L + 2W$$

$$L = 3W$$

$$240 = 2(3W) + 2W$$

$$8W = 240$$

$$\underline{W = 30}$$

$$L = 3(30)$$

$$\underline{L = 90}$$

$$A = LW$$

$$A = (30)(90)$$

$$A = 2700 \text{ ft}^2$$

→ Check:

$$240 = ? 2(90) + 2(30)$$

$$240 = 240 \checkmark$$

**The area of the dog run is 2700 square feet.**