

# Unified Summer Problems

Name: \_\_\_\_\_

Date: \_\_\_\_\_

1.  $(2^6)^3 =$  \_\_\_\_\_

A.  $2^9$

B.  $2^{18}$

C.  $12^3$

D.  $18^2$

1. \_\_\_\_\_

2. Simplify:  $(12)^{-2}$

A. 144

B.  $-\frac{1}{144}$

C.  $\frac{1}{144}$

D. -144

2. \_\_\_\_\_

3. Simplify:  $\left(\frac{3}{2}\right)^{-3}$

A.  $-\frac{27}{8}$

B.  $-\frac{8}{27}$

C.  $\frac{8}{27}$

D.  $\frac{27}{8}$

3. \_\_\_\_\_

4. Rewrite  $\frac{1}{8^{-3}}$  using a positive exponent and evaluate the result.

A.  $\frac{1}{\sqrt[3]{8}} = \frac{1}{2}$

B.  $\frac{1}{8^3} = \frac{1}{24}$

C.  $\frac{1}{8^3} = \frac{1}{512}$

D.  $8^3 = 512$

4. \_\_\_\_\_

5. Simplify:  $\frac{3^{-15}}{3^5}$

A.  $3^{-10}$

B.  $3^{-20}$

C.  $3^{-3}$

D.  $1^{-10}$

5. \_\_\_\_\_

6. Simplify:  $\frac{2^4 3^{-2}}{5^2} \cdot \frac{3^4 5^{-1}}{2^2}$

A.  $\frac{2^2 3^{-8}}{5^{-3}}$

B.  $\frac{2^{-2} 3^2}{5}$

C.  $\frac{2^2 3^2}{5^3}$

D.  $\frac{2^{-2} 3^2}{5^2}$

6. \_\_\_\_\_

7. Simplify:  $\frac{2^{-3}4^2}{9^3} \div \frac{2^5 4}{9^{-1}}$  7. \_\_\_\_\_

- A.  $\frac{2^3 4^3}{9^4}$       B.  $\frac{2^2 4^3}{9^2}$       C.  $\frac{4^3}{2^8 9^4}$       D.  $\frac{4}{2^8 9^4}$

8. For each of the following find the value of  $n$ . 8. \_\_\_\_\_

a)  $2^5 \times 5^n = 0$        $n = \underline{\hspace{2cm}}$

b)  $3^6 \times n^6 = 0$        $n = \underline{\hspace{2cm}}$

c)  $7^5 \times 7^{10} = n^{15}$        $n = \underline{\hspace{2cm}}$

d)  $4^3 \times 4^n = 1$        $n = \underline{\hspace{2cm}}$

9. Write  $3x - y = 9$  in slope-intercept form ( $y=mx+b$ ). 9. \_\_\_\_\_

- A.  $y = 3x + 9$       B.  $y = 3x - 9$       C.  $x = \frac{1}{3}y + 3$       D.  $x = -\frac{1}{3}y + 3$

10. Which equation describes the line with slope of 2 and containing the point  $(-1, 4)$ ? 10. \_\_\_\_\_

- A.  $y = 2x + 4$       B.  $y = 2x + 6$       C.  $y = -2x + 4$       D.  $y = 2x + 5$

11. Which equation describes the line with slope of 3 and containing the point  $(-3, -2)$ ? 11. \_\_\_\_\_

- A.  $y = -\frac{1}{3}x - 3$       B.  $y = -3x - 11$       C.  $y = \frac{1}{3}x - 1$       D.  $y = 3x + 7$

12. Which equation describes the line with an undefined slope and containing the point  $(-3, -1)$ ? 12. \_\_\_\_\_

- A.  $x = -3$       B.  $y = -3$       C.  $y = -3x - 1$       D.  $x = -1$

13. Complete the table. Use slope-intercept form where applicable

equation	$y = mx + b$	slope	y-int.	x-int.
$2x + 3y = 24$				
$4x - y - 5 = 0$				
$2y + 16 = 0$				
$3x = 9$				
$4x - (2y - 6) = 0$				

13. \_\_\_\_\_

14. What is the slope of the line determined by the points  $(-1, 2)$  and  $(6, -3)$ ?

14. \_\_\_\_\_

15. What is the value of  $x$  in the following equation?

15. \_\_\_\_\_

$$4(2x + 1) = 27 + 3(2x - 5)$$

- A. 21                      B. 9                      C.  $7\frac{1}{2}$                       D. 4

16. Solve:  $3(x - 4) = 2x - (6 + x)$

16. \_\_\_\_\_

- A.  $x = -1$                       B.  $x = 2$                       C.  $x = 3$                       D. no solution

17. Solve:  $w - 2(8 - w) = -31$

17. \_\_\_\_\_

- A. -5                      B. 12                      C. 15                      D. 47

18. Solve:  $\frac{1}{3}y + 3 = 8 - \frac{1}{6}y$

18. \_\_\_\_\_

- A. 3                      B. 6                      C. 10                      D. 30

19. Solve:  $\frac{5}{8}x - 9 = -3 + \frac{1}{4}x$

19. \_\_\_\_\_

- A. 8                      B. 12                      C. 16                      D. 48

20. Solve:  $\frac{3}{2}(x + 4) = 5 - \frac{1}{3}(4 - x)$  20. \_\_\_\_\_
- A. -14                      B. -9                      C.  $-5\frac{4}{7}$                       D. -2
21. Look at the equation. 21. \_\_\_\_\_
- $6(x - 3) = 4(x - 4) + 2(x - 1)$
- How many solutions are possible for the equation?
- A. no solution              B. one                      C. two                      D. infinite
22. Solve:  $7x - 2(3x + 1) = 4x - (3 - x) - 19$  22. \_\_\_\_\_
- A. 5                      B. 6                      C. 10                      D. 12
23. Solve:  $7m + 11 - 5m - 2 = 2m - 9$  23. \_\_\_\_\_
- A. -2                      B. 3                      C. 7
- D. no solution
24. Solve:  $4 - 5(x + 1) = 2 - 3x$  24. \_\_\_\_\_
- A.  $x = -\frac{3}{2}$                       B.  $x = 1$                       C.  $x = \frac{3}{2}$                       D.  $x = \frac{7}{2}$
25. What is the intersection of the lines  $2x + y = 2$  and  $-3x - 2y = -6$ ? 25. \_\_\_\_\_
- A.  $(-2, -2)$                       B.  $(-2, 6)$                       C.  $(4, -2)$                       D.  $(4, 3)$
26. Solve by graphing:  $y = -x + 2$  26. \_\_\_\_\_  
 $y = 3x + 6$
- A.  $(-3, 1)$                       B.  $(-2, 0)$                       C.  $(-1, 3)$                       D.  $(2, 0)$

27. Solve:  $y = 3x - 3$   
 $-2x - 4y = 26$  27. \_\_\_\_\_
- A.  $(-1, -6)$       B.  $(1, -7)$       C.  $(3, -6)$       D.  $(7, 1)$
28. Solve the following system of equations for  $y$ : 28. \_\_\_\_\_
- $4x - y = 10$   
 $3x + 5y = 19$
- A.  $-2$       B.  $\frac{31}{17}$       C.  $2$       D.  $3$
29. Given the system below, solve by elimination. 29. \_\_\_\_\_
- $4x + 3y = 10$   
 $5x + 4y = 13$
- A.  $(5, -3)$       B.  $(1, 2)$       C.  $(-2, 6)$       D.  $(-5, 7)$
30. Solve the following system of equations for  $x$ : 30. \_\_\_\_\_
- $9x + 7y = 17$   
 $6x - 5y = -8$
- A.  $-\frac{29}{3}$       B.  $-3$       C.  $\frac{1}{3}$       D.  $2$
31. Sally buys 12 tickets to the Fun-Time Circus for a total of \$58. If adult tickets cost \$6.00 each and child tickets cost \$2.50 each, which system of equations best represents the situation.  $A$  represents the number of adult tickets bought and  $C$  the number of children tickets bought. 31. \_\_\_\_\_
- A.  $6A + 2.5C = 12$   
 $A + C = 58$       B.  $A = 58 - C$   
 $6A + 2.5C = 12$
- C.  $6A + 2.5C = 58$   
 $A = C + 12$       D.  $A + C = 12$   
 $6A + 2.5C = 58$

32. Here are the details for two competing long distance phone plans:

32. \_\_\_\_\_

- TalkMor charges \$15/month plus \$0.05/minute.
- GabFest has no monthly amount, but charges \$0.10/minute.

- a) What condition(s) would cause the two plans to have the same cost?
- b) What would be the cost of each plan for 200 minutes of long distance calling in one month?
- c) If you were asked to recommend a long distance phone plan to your friend who lives across the country, what information would you get from your friend in order to make a recommendation?

33. Jorge's Boat Rental charges a \$100.00 deposit and then \$25.00 per hour. Boats R Us charges a \$150.00 deposit but only \$15 per hour. Which company should be used if someone needs to rent a boat for 8 hours? Show your solution by drawing a graph, solving an equation, or making a table.

33. \_\_\_\_\_

34. The fine for speeding in a certain state is determined by using the formula

34. \_\_\_\_\_

$$F = 10(S - 55) + 70$$

where  $F$  is the fine in dollars and  $S$  is the speed of the vehicle in miles per hour.

- a) What is the fine for driving at a rate of 63 mph? \_\_\_\_\_
- b) Suppose you are fined \$200. How fast were you driving? \_\_\_\_\_
- c) At what speed would you receive the minimum fine of \$70? \_\_\_\_\_

In a neighboring state, the fine for speeding is determined by the formula

$$F = 4(S - 65) + 200$$

where  $F$  is the fine in dollars and  $S$  is the speed of the vehicle in miles per hour.

- d) Joseph was caught speeding in both states. Find the speed at which both fines would be equal.

35. Which of the following relations is *not* a function?

35. \_\_\_\_\_

A.

$x$	$y$
1	2
2	3
3	4
4	5

B.

$x$	$y$
2	3
4	5
6	7
8	9

C.

$x$	$y$
-2	2
-1	3
0	4
1	5

D.

$x$	$y$
1	4
2	6
1	5
2	6

36. Which of the following sets is a function?

36. \_\_\_\_\_

A.  $\{(4, 2), (4, 6), (8, -3)\}$

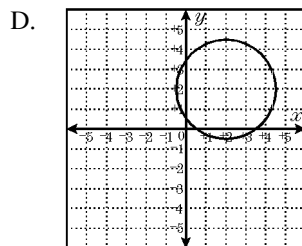
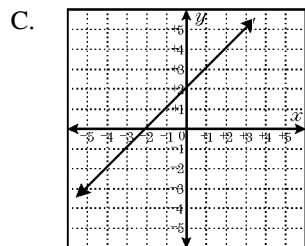
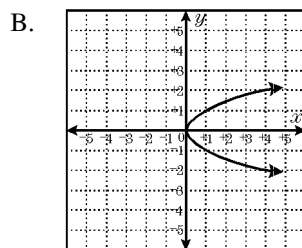
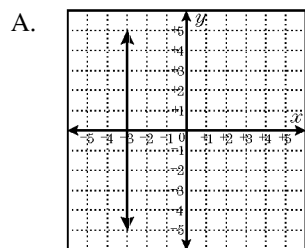
B.  $\{(-1, -1), (-2, 7), (-1, 3)\}$

C.  $\{(-6, 1), (4, 7), (-6, 3)\}$

D.  $\{(9, 0), (8, 1), (7, 2)\}$

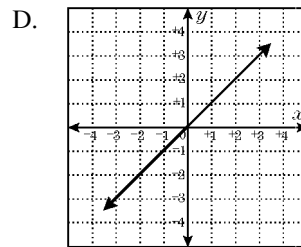
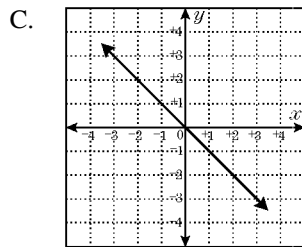
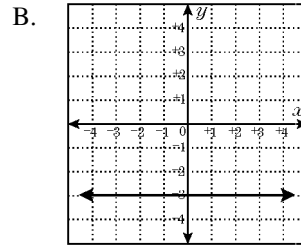
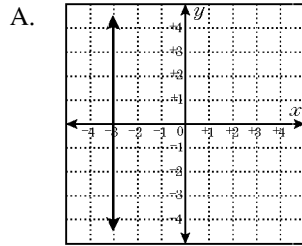
37. Which of the following is a function?

37. \_\_\_\_\_



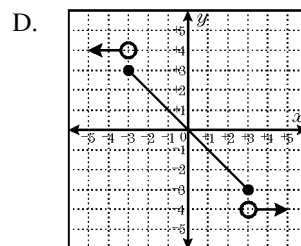
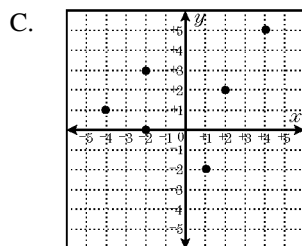
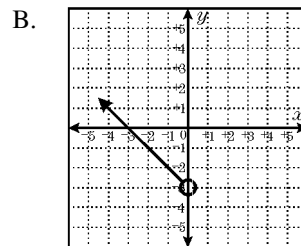
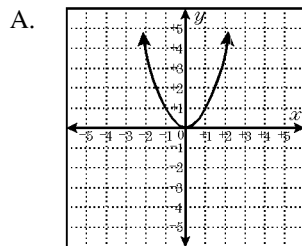
38. Which of the following graphs is *not* a function?

38. \_\_\_\_\_



39. Which of the following graphs is *not* a function?

39. \_\_\_\_\_





40. Study the functions.

40. \_\_\_\_\_

**Function C**

$$y = \frac{3}{2}x - 5$$

**Function D**

$x$	$y$
-3	-5
0	-1
3	3
6	7

Which function has the steeper slope?

- A. Function C has a steeper slope,  $-5$ , than Function D slope of  $-3$ .
- B. Function D has a steeper slope,  $\frac{4}{3}$ , than Function C slope of  $\frac{3}{2}$ .
- C. Function C has a steeper slope,  $\frac{3}{2}$ , than Function D slope of  $\frac{4}{3}$ .
- D. Function D has a steeper slope,  $\frac{3}{4}$ , than Function C slope of  $\frac{3}{2}$ .

41. Study the functions.

41. \_\_\_\_\_

**Function G**

$$y = \frac{1}{6}x - 3$$

**Function H**

$x$	$y$
-4	-5
0	-2
4	1
8	4

Which function has the steeper slope?

- A. Function H has a steeper slope,  $\frac{3}{4}$ , than Function G slope of  $\frac{1}{6}$ .
- B. Function G has a steeper slope,  $6$ , than Function H slope of  $\frac{3}{4}$ .
- C. Function H has a steeper slope,  $\frac{4}{3}$ , than Function G slope of  $\frac{1}{6}$ .
- D. Function G has a steeper slope,  $-3$ , than Function H slope of  $-2$ .