LSM 0103 - Final Review

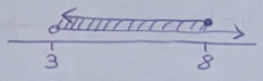
1. What is the name of each of the below number sets?
   a. $\{0, 1, 2, 3, \ldots\}$ = whole numbers
   b. $\{\ldots, -2, -1, 0, 1, 2, \ldots\}$ = integers

2. State whether each of the numbers is rational or irrational:
   a. 2.54 → rational
   b. -7 → rational
   c. 6π → irrational
   d. $\frac{2}{7}$ → rational
   e. $-\sqrt{16}$ → rational
   f. $\sqrt{3}$ → irrational

3. The sets A and B are given below: intersect
   $A = \{-3, -1, 0, 1, 2, 4, 6\}$
   $B = \{-4, -3, -2, -1, 1, 2, 3\}$

   Find $A \cap B$ = $\{-3, -1, 1, 2\}$

4. The sets C and D are given below: infinite sets
   $C = \{x | x > 3\}$
   $D = \{x | x \leq 8\}$

   $(3, 8]$

   Find $C \cap D$ = ~~factual~~ $\{x | 3 < x \leq 8\}$

5. The sets A and B are given below:
   $A = \{-3, -1, 0, 1, 2, 4, 6\}$
   $B = \{-4, -3, -2, -1, 1, 2, 3\}$

   union
   combine altogether.

   Find $A \cup B$ = $\{-4, -3, -2, -1, 0, 1, 2, 3, 4, 6\}$

6. Amal has a jewelry business. Her profits in AED can be calculated using the following formula:

$p = 75x - 250$

where p is the profit in AED, and x is the number of items she sells.

If she sold 22 items last month, what was her profit?

$75 \times 22 - 250 = 1400$ is her profit

1,650

7. A rental car company charges a flat fee of 120 AED and then 85 AED per day. Write an expression that represents the cost, **C**, of renting a car for **D** number of days.

$C = 120 + 85d$

8. Simplify the expression using distribution.

$-2(4x - \pi) =$ $-8x - 2\pi$

9. Simplify the expression using distribution and combining like terms.

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

$3x + 6y - 4x - 4y$

$-1x - 2y$ is the expression.

10. Evaluate the following:

$-|-3| - 5 =$ _____

11. Convert the below number to scientific notation:

$0.000907 =$ _____

12. Convert the below numbers from scientific notation to standard notation:

$1.23 \times 10^{4} =$ _____ $1.23 \times 10^{-3} =$ _____

13. Light travels 3×10^5 kilometers in one second. How far does it travel in 6.8 seconds? Write your answer in scientific notation.

14. Simplify.

$$\frac{y^{-3}y^6}{y^2} =$$

15. Simplify.

$$\left(\frac{7k}{n^2}\right)^{-2} =$$

16. Simplify.

$$(-64)^{-2/3} =$$

17. Write the expression using rational exponents:

$$\sqrt[5]{x^4} =$$

18. Simplify:

$$\sqrt{50x^3y^7z} =$$

19. Simplify:

$$\frac{a^{\frac{2}{5}}a^{\frac{4}{5}}}{a^{\frac{3}{5}}}$$

20. Simplify:

$2\sqrt{xy} - 6\sqrt{xy} + \sqrt{xy}$

21. For the below polynomials:

a. $3x^3 + 4x^5 - 2x$

Degree = _____ ; Leading coefficient = _____ ; Number of terms = _____

b. $3y^4$

Degree = _____ ; Leading coefficient = _____ ; Number of terms = _____

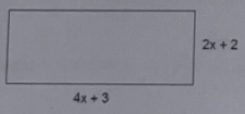
22. Simplify:

$(-2y^2 + 7y - 4) - (-3y^2 + 2y - 1)$

23. Distribute and simplify:

$5b^4(9b + 2b^3)$

24. Find an expression for the area of this rectangle.



25. Simplify:

$(3x - 2y)^2$

26. Factor out the greatest common factor in the expression:

$6n^2 + 9n^5$

27. Factor the below expression by grouping.

$4y^3 - 5y^2 + 8y - 10$

28. Factor.

$z^2 - 16$

29. Factor.

$2y^2 - 5y + 3$

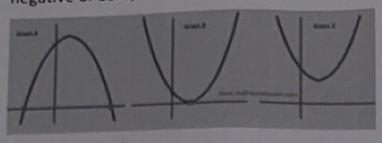
30. For each of the below quadratic equations, find the solutions.

a. $(x - 5)(x + 7) = 0$

b. $x^2 - 2x = 35$

c. $x^2 - 12x + 35 = 0$

31. For each quadratic graph, state whether a is positive or negative, the discriminant is positive or negative or zero, and how many roots are there.



In Graph A, the value of ***a*** is _____, the discriminant is _____, and there are _____ real roots.

In Graph B, the value of ***a*** is _____, the discriminant is _____, and there are _____ real roots.

In Graph C, the value of ***a*** is _____, the discriminant is _____, and there are _____ real roots.

32. Solve.

$3(x-4)-9=6x$

33. For each of the below equations, state whether there is no solution, one solution, or infinitely many solutions:

a. $5(x-3)+11=2(x-2)+3x$

This equation has _____.

b. $4(x-2)+2=6x$

This equation has _____.

c. $3(2x+1)=6(x-5)$

This equation has _____.

34. Solve the below equation for **c**.

$K = a - b + c$

35. Solve the below equation for **a**.

$F = ma$

36. Solve the below equation for **d**.

$S = n(a + d)$

37. Solve.

$-3 \leq -3y + 24$

38. Solve.

$\frac{1}{4}y < -1$ or $3 + y \geq 5$

39. Solve.

$0.36w \leq 0.54$ and $-\frac{1}{2}w > 3$

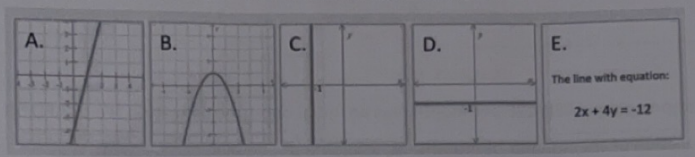
40. Solve.

$-3 < -2x + 1 \leq 9$

41. Fill in the below table of missing values for the linear equation:

44. What is the equation of the line through the point (2, -3) with slope, m = - 4?

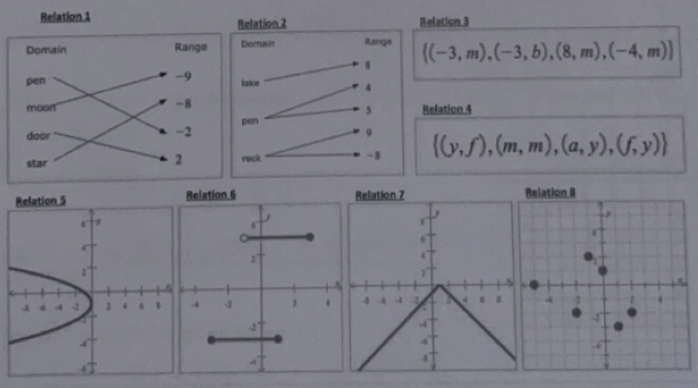
45. Find the x and y intercepts for each of the below examples:



46. The equation x = - 2 represents a _____ and it has a slope which is _____.

The equation y = 4 represents a _____ and it has a slope which is _____.

47. State whether each of the below relations is a function.



48. Given:

$f(x) = 2x^2$ and $g = \{(-1, 2), (-2, -3), (0, -1)\}$

Find:

$f(-4) =$ _____

$g(-1) =$ _____

49. The cost of a phone plan is AED 125 per month plus an initial one-time activation fee of AED 50. The cost, ***C***, as a function of the number of months, ***m***, using the phone plan can be written as

$C(m) = 125m + 50$

What is the cost if I use the plan for 6 months? _____

If I paid a total of AED 1425, how many months have I been using the plan?

_____

50. What is the domain and range of the below graph?

