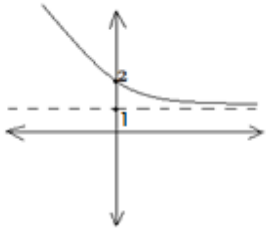
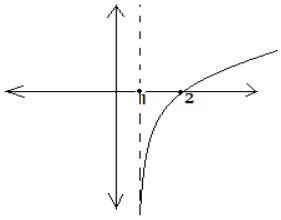
MATHEMATICS WORK SHEET FOR GRADE 10th on unit 4

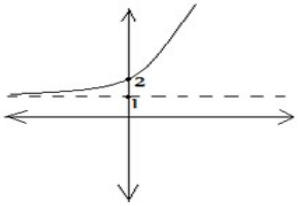
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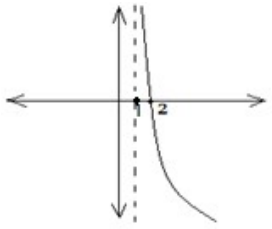
I. CHOOSE THE BEST ANSWER FROM THE SUGGSTED OPTIONS.

1. From the graphs shown below, which one can be taken as the possible graph of the exponential function f(x) = 1 + 2^x ?

A. 

B. 

C. 

D. 

2. Which of the following exponential equation indirectly explain the Statement ''a is the logarithm of b to the base c''?

A. $b=a^c$ B. $b=c^a$ C. $a=b^c$ D. $c=a^b$

3. The simplified form of $\log_{\frac{1}{3}}27-\log_{\frac{1}{8}}\sqrt[4]{32}$ is equal to?

A. $\frac{-5}{12}$ B. $\frac{3}{4}$ C. $\frac{31}{12}$ D. $\frac{-31}{12}$

4. Which of the following is **not true** about the graph of $f(x)=2^x+5$

A. $5¿f(x)<6$, for $x<0$ C. $f(x)>6, for\ x>0$

B. The range is $(6,\infty)$ D. The y-intercept is 6

E. None

5. Which of the following is **true** about graph of $f(x)=\log^x{}_3$ for x>0

A. $its\ intercept\ is\ (0,1)$ C. its range is positive real number

B. It is decreasing function D. f(x)>0, for x>1

E. None

6. If $f(x)=\log_2 x$ and $g(x)=\log_4 x$, then which of the following is **not true**?

A. $f(x)>0\ for\ 0<x<1$ C. $f(x)$ keeps increasing as x increases.

B. $f(x)>g(x)\ for\ x>1$ D. $f(x)<g(x)\ for\ 0<x<1$ E. None

7. For what value of x if $\left(\sqrt[5]{\frac{1}{32}}\right)^{2-x}=\left(\frac{1}{128}\right)^{\frac{x+1}{3}}$

A. $\frac{1}{10}$ B. $-¿10$ C. $\frac{-1}{10}$ D. $\frac{-13}{4}$

8. Which of the following is **true** for a given exponential function f(x) $=\left(\frac{1}{a}\right)^x$, where a > 1?

A. f(x) ≥ 1, where x > 0
C. f(x) > 1, where x < 0
B. f(x) > 1, where x = 0
D. f(x) = 1, for 0 < x <1
E. None

9. If $3^{2x-1} = 4$, then the value of x:

A. $\log_3 2 + \frac{1}{2}$
C. $\log_3 4 + \frac{1}{2}$
B. $\frac{1}{2}\log_3 4 + 1$
D. $\frac{1}{2}(\log_3 4 + \frac{1}{2})$
E. None

10. Which of the following is **not** properties of the logarithm function of $f(x) = \log_a x$, a > 1?

A. Domain, (0, ∞)
C. Asymptote x-axis
B. Range, R
D. increasing function
E. None

11. If 2000birr is invested today at a rate of 8% compounded semi-annually, what will be the amount after one year?

A. 4665.60 birr
B. 2332.80 birr
C. 1166.40 birr
D. 2160 birr
E. None

12. What is the value of x if $\log x = \frac{-3}{2}$?

A. $2\sqrt{10}$
B. $(\sqrt{10})^3$
C. $\frac{1}{\sqrt{10}}$
D. $\frac{1}{10\sqrt{10}}$

13. Solution set of $\ln(2x-1) = \ln(4x-3) - \ln x$ is?

A. $\{\frac{-3}{2}, -1\}$
B. $\{1, \frac{3}{2}\}$
C. {1, 3}
D. {−1}
E. None

14. The solution set the equation $(0.09)^x = (0.3)^{x+2}$ is equal to:

A. x = {2}
B. x = {−2}
C. x = {1}
D. x = {−1}

15. The solution of $\left(\frac{1}{3}\right)^x < \frac{1}{9}$ is:

A. $\frac{1}{2} < x < 0$
B. x > 2
C. {x < −2}
D. {x < 2}

16. If $\log_3 x - \log_9 y = 1$, then which of the following is **true**?

A. $x = \sqrt{3y}$
C. $x = \frac{1}{3}\sqrt{y}$

B. $x = 3\sqrt{y}$ D. $y = \frac{1}{3}\sqrt{x}$

17. If $\log_4 a = 2$, then $\log_{\sqrt{a}} 64$ is equal to:

A. –¿3/2 B. –¿3 C. 3

D. –¿2/3

18. Let $\ln e^{4x} = \frac{1}{4}$ then the value of **x** is:

A. $-\frac{1}{16}$ B. $-\frac{1}{4}$ C. $\frac{1}{4}$ D. $\frac{1}{16}$

E. None

19. Which one of the following is **false**?

A. $\ln\frac{1}{e} = -1$ B. $5^{\log_5 3}=3$ C. $\ln x=\log_e x$, x>0 D. $\ln 0 = 1$ E. None

20. $(\sqrt{3})^{3-x} = 1$ the value of x is:

A. $\frac{1}{3}$ B. – 3 C. 3

D. $-\frac{1}{3}$

21. The simplified form of $\log_{100}(0.01\sqrt{0.01})$ is

A. $\frac{-3}{2}$ B. $\frac{-3}{4}, C.\frac{3}{4} D.\frac{3}{2}$

22. If $\log 2=0.3010$ and $\log 3=0.4771$ then $\log 12$ is equal to

A. 1.0791 B. 1.2552 C. 0.6020

D. 0.9542

23. Which of the following points is not on the graph of $y=\log_2 x$?

A. $(1,0) B.(0,1) C.\left(\frac{1}{2},-1\right) D(2,1)$

24. Which one of the following logarithm of 1600 to the base $2\sqrt[3]{5}$

A. {4} B. {1} C. {2}

D. {6}

25. What is the solution set of the equation $\left(\frac{4}{25}\right)^{x-2}=\left(\frac{5}{2}\right)^{2x+8}$?

A. $\{1\}$ B. $\{-1\}$ C. $\left\{\frac{5}{2}\right\}$

D. $\varnothing$

26. A function is said to be an exponential function, where

A. $f(x)=a^x$, $a \epsilon R$ and $a\neq 1$ C. $f(x)=a^x$ a>0 and $a\neq 1$

B. f(x)=ax, a≠0 D. $f(x)=a^x$, a>0

27. The solution of the equation $(3^x)^2 \cdot 5^x = 3\sqrt{5}$ is:

A. $\frac{-1}{2}$ B. $\frac{-1}{45}$ C. $\frac{1}{45}$ D. $\frac{1}{2}$

28. What is the value of x that makes $2^{2x-1}=3$?

A. $x=\frac{1}{2}(\log_2 3)+1$ C. $x=\frac{1}{2}+\log_2 3$

B. $x=\log 3+\log 2$ D. $x=\frac{1}{2}(1+\log_2 3)$ E. None

29. The solution set of log(x+3)+log x=1 is

A. $\{-5,2\}$ B. { −¿5} C. {2} D. $\{\}$

30. The solution set of $(\frac{2}{3})^{2x+1}=(\frac{9}{4})^x$ is

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

31. What is the solution set of the equation? $\log_2(9^{x+1}+3)=2+\log_2 3$?

A. $\{-1\}$ B. $\{0,1\}$ C. $\{0\}$ D. $\{2,3\}$

32. What is the value of the product? $\log_2 3 \times \log_3 4 \times \log_4 5 \times \log_5 6 \times \log_6 7 \times \log_7 8$?

A. 1 C. 3

B. $\log_{5040} 20160$ D. 2

33. The solution set of $\log_x 3x-2 = 2$ is equal to:

A. {1, 2} B. {1, −¿2} C. {2} D. {−¿1, −¿2}

34. If $\log^3_a$ = x and $\log^2_a$ = y, where a>0 and a≠1 then $\log_a \frac{6}{a}$ is equal to

A. $\frac{1}{x+y}$ B. 1 −¿ (x+y) C. x+y+1 D. x+y−¿1

35. If $\log_2$=x and $\log_3$=y, then $\log_{72}-¿\log_{12}$ is equal to

A. x−¿y B. x+y C. 2x+3y D. 4x+4y

36. Simplified form of $\log_{\frac{1}{16}} 2\sqrt{8}$ is

A. $\frac{5}{8}$ B. −¿10 C. $\frac{-5}{8}$ D. 10

37. What is the solution set of $\log_8 4x = \log_6 6$?

A. $\left\{\frac{-1}{2}\right\}$ B. *have no solution* C. $\{2\}$

D. $\left\{\frac{1}{2}\right\}$

38. What is the solution set of the equation? $\log_4(x) - \log_2(x-1) = \frac{1}{2}$

A. {0} B. {1} C. {2} D. {3}

E. None

39. The solution set of $\log_3 x + \log_x 3 = 7$ is

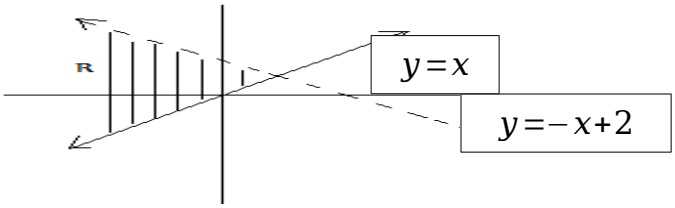
A. {0, 5} B. $\{1, \frac{1}{9}\}$ C. {9, 243} D. $\{1, \frac{1}{243}\}$ E. None

40. If x is any positive real number which of the following is equal to $(\log x)^2$

A. $2\log_2 x$ B. $\frac{1}{2}\log x$ C. $(\log x)(\log x)$ D. $\log x + \log x$

I. CHOOSE THE BEST ANSWER FROM THE SUGGSTED OPTIONS.

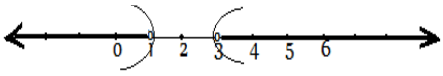
1. Which of the following is **true** of the relation represented by the graph below?

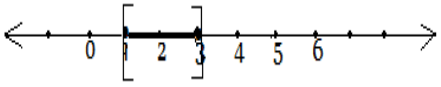


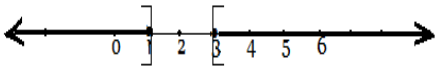
A. R = {(x, y): y≤ x and y $\geq -x+2$} C. The domain relation ={x: x > 1}

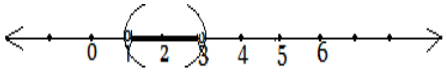
B. R = {(x, y): y ≥ x and y $\geq -x+2$} D. The range relation = {y: y ∈ *R*}

2. On the following number line, intervals are indicated by bold line. Which one of the intervals indicates the solution of the absolute inequality **|2 − x| ≤ 1**?

A. 

C. 

B. 

D. 

3. The truth set of the in equality $3x^2 - 4x + 4 < 0$ is

A. ∅ B. $(-\infty, -6) \cup (2, \infty)$ C. $(-6, 2)$ D. *R*

4. Let **M={x∈*R*: x∉(-1, 1]}** which one of the following interval is the correct description of M

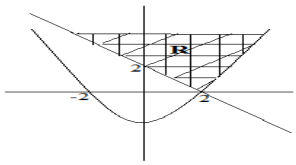
A. $(-\infty, -1] \cup (1, \infty)$ B. $(-\infty, 1) \cup (1, \infty)$ C. $(-\infty, -1] \cup$ D. *R*

5. The solution set for ¿$x^2+x-6\vee\leq$ **0**

A. $(-3,2)$ B. {−¿3, 2} C. $(-\infty,-3]\cup(2,\infty)$

D. R

6. What is the range of the relation which is graphed below?



≥ 2 ≥ 0

A. y: y C. y

B. y: y is real number D.

y: $-¿2\leq y\leq 2$

7. From the following sets which one is the solution set of $6x-2x^2>0$?

A. $(-\infty,0)\cup(3,\infty)$ B. $(0,3)$ C. $(-\infty,0]\cup[3,\infty)$ D. $[0,3]$

8. If we describe by interval by interval notation **{x: 4x**−¿**6**¿x<7**}**

A. $\emptyset$ B. (2, 7) C. (−¿∞, 2)

D. (−¿∞, 7)

9. The system of linear inequalities $\begin{cases} x\geq 1 \\ x\leq 3 \\ y\geq 1 \end{cases}$ which one is the solution of the inequalities?

A. S = {(x, y): [1, 3] ×¿} C. S = {(x, y): (-∞,1]∪¿×[1, ∞¿}

B. S = {(x, y): (1, 3)×(1, ∞)} D. S = {(x, y): [1, 3]}

10. What is the solution set of the inequality **4x² + 4x + 1**¿ **0**

A. $R/\{\frac{-1}{2}\}$ B. $(\frac{-1}{2},\frac{-1}{2})$ C. $(-\infty,\frac{-1}{2})$

D. R

11. The solution set of absolute inequalities $|1-2x|\geq 2$ is:

A. {x: x $\geq -\frac{1}{2}$ or x$\leq\frac{3}{2}$} C. {x: x$\leq \frac{1}{2}$ or x $\geq\frac{3}{2}$ }

B. {x: x$\leq -\frac{1}{2}$ or x$\geq\frac{3}{2}$ } D. {x: x $\geq -\frac{1}{2}$ or x$\geq -\frac{3}{2}$ }

12. The solution set of the inequality $(x-3)^2<x-3$

A. [3, 4] B. (−¿∞, 3) C. (−¿∞,3)∪ (4, ∞)

D. (4, ∞)

13. The solution set the inequality $|x+2|<2x$

A. x ¿2 B. (−¿∞, 2) C. (−¿∞,2)∪ (2, ∞)

D. [2, ∞)

14. The solution set of the inequality **2x – 3 < x < 2 – 3x** is:

A. $(\frac{-3}{2}, -¿2)$ B. $(\frac{-3}{2}, 1)$ C. $(-\infty, \frac{1}{2})$ D. $(\frac{3}{2}, 3)$ E. None

15. The solution set for $\mathbf{x^2 + 2x + 3 < 0}$:

A. $(-2,-1)$ B. $\emptyset$ C. $(-\infty,-2) \cup (-¿1,\infty)$ D. R

16. Which one of the following is the value of **k** if $\mathbf{2x^3+¿4x^2+¿kx=0}$ has exactly one real root.

A $\emptyset$ B. $[k>2]$ C. $[k<2]$ D. R

17. The solution set of $-1 \leq \frac{3-5x}{2} \leq 9$ is

A. $[-3,1)$ B. $[-3,1]$ C. $(-3,1)$ D. $[-3,9]$

18. For what value of K the quadratic equation $\mathbf{2x^2+¿kx+¿2=0}$ has two distinct real root.

A $(-\infty,-4) \cup (4,\infty)$ B. $[-4,4]$ C. $(-4,4)$ D. R

19. The solution of $\left(\frac{1}{3}\right)^x < \frac{1}{9}$ is

A. $\frac{1}{2} < x < 0$ B. {x < −¿2} C. x > 2 D. {x < 2}

20. Which one of the following inequality is empty set?

A. $4x^2-4x+¿1¿0$ B. $4x^2-4x+¿1 \leq 0$ C. $4x^2-4x+¿1 \geq 0$ D. $4x^2-4x+¿1¿ 0$

21. Which one of the following sets contains the solution for $\mathbf{(x-¿3)^2-¿1 \geq 0}$?

A. {2, 4} B. [1, 3] C. (−¿∞, 2)∪(4, ∞) D. (−¿∞, 2]∪[4, ∞)

22. The solution set of the quadratic inequality $2x^2+3x-2 \leq 0$ is

A. $(-\infty,2] \cup \left[\frac{1}{2},\infty\right)$ B. $\left(-2,\frac{1}{2}\right)$ C. ¿ D. $\left[-2,\frac{1}{2}\right]$

23. The solution set of the inequality $¿3-5x \vee \geq \mathbf{2}$ is

A. $\left[\frac{1}{5},1\right]$ B. $\left(-\infty,\frac{1}{5}\right] \cup [1,\infty)$ C. $\left(-\infty,-1\right] \cup \left[\frac{-1}{5},\infty\right)$ D. $\left(-1,-\frac{1}{5}\right)$

24. The solution set of inequality $-¿\mathbf{2 \leq x - 4 < 6}$ can be given as:

A. [2, 10] B. [2, 10) C. [−¿6, 2) D. (−¿6, 10]

25. The truth set of $\mathbf{x^2-9x+18<0}$ is

A. (3, 6) B. (−¿∞, 3) C. (−¿∞,3)∪ (6, ∞)
D. (6, ∞)

26. Which one of the following is the number if the sum of a non –negative number and its square is less than 20 A. (−¿5, 4) B. (0, 4)
C. (−¿∞,−¿5)∪ (4, ∞) D. (4, ∞)

27. Which one of the following sets is equal to **S={x∈*N*: −¿2≤x≤4}**
A. ∅ B. [−¿2, 4] C. (−¿∞,−2]∪ [4, ∞)
D. [1, 4]

28. For what value of k is **x^2−¿9x+k<0** for **x∈(−¿2, 11)**
A. k>−¿22 B. k=−¿22 C. k<−¿22
D. k≠−¿22

29. Which one of the following is **not true** about absolute value inequality solution?
A. |*x*|>¿x, S ={*R*} C. |*x*−1|≥x−¿1 S ={*R*}
B. |*x*−1| ¿x−¿1 S ={x¿1} D. |*x*+3| ¿x+¿3 S ={x¿0}

30. Which one of the following is always true?
A.|*x*+*y*|≥|*x*|+|*y*| B. |*x*−*y*|≥|*x*|+|*y*| C.|*x*−*y*|≤|*y*−*x*| D. |*x*−*y*|≤|*x*|−¿*y*∨¿

31. What is the equation of a line whose x-intercept and y-intercept are **1** and −¿**2** respectively?
A. 3x−¿2y−¿2=0 B. x−¿y+2=0 C. 2x−¿y−¿2=0
D. −¿2x−¿y+3=0

32. If equation of the line *l* is passes through the point **(1, 5)** and has inclination **45°** with x-axis, then which one of the following equation is satisfy?
A. y = x + 1 B. y−¿x−¿6 = 0 C. y = x−¿6
D. y = x + 4

33. If two equations of line such that $y_1 = a_1x + b_1$ and $y_2 = a_2x + b_2$ where a_1, $a_2 \neq 0$ are parallel lines but not overlap on each other, then which one of the following is **true**?
A. $a_1 = a_2$ and $b_1 = b_2$ C. $a_1 = a_2$ and $b_1 \neq b_2$
B. $a_1 \neq a_2$ and $b_1 = b_2$ D. $a_1 \neq a_2$ and $b_1 \neq b_2$

34. What is the equation of a line passing through **(1, −¿3)** with slope of **m = −¿ 4**
A. −¿4x+3y=0 B. −*y*−¿4x+1=0 C. 3x−¿4y=0
D. 2y−¿4x=0

35. The equation of the lines passing through **(x_0, y_0)** that is perpendicular to **Ay+By+C=0** is?

A. $A(X-x_O)+B(y-y_0)=0$ C. $A(X-x_0)-B(Y-y_0)=0$

B. $A(Y-y_0)-B(X-x_0)=0$ D. $A(Y-y_0)+B(X-x_0)=0$

36. P and Q have coordinates **(−¿1, −¿2)** and **(3, 2)** respectively, find the coordinate of **R** which is between P and Q, if R divides PQ in the ratio **3:5**

A. $\left(\frac{1}{4},-\frac{1}{4}\right)$ B. $\left(\frac{-1}{4},\frac{1}{4}\right)$ C. $\left(\frac{1}{2},-\frac{1}{2}\right)$

D. $\left(\frac{-1}{2},\frac{1}{2}\right)$

37. The distance of a line segment whose end points have coordinates **(x, −¿2)** and **(−¿2, 1)** is **3** units long, and then what is the value of '**x**'?

A. 2 B. −¿2 C. 5

D. −¿5

38. Which of the following lines is parallel to the line **3x−¿7y=0?**

A. 7y+3x = −¿2 B. 7y=−¿3x C. −¿3x+7y =4

D. −¿3x−¿7y=1

39. If the line passing through points **(−¿3, 4)** and **(2, t+3)** is parallel to the line passing through points **(−¿2, t)** and **(1, 1),** then what is the value of t?

A. $\frac{-1}{2}$ B. 1 C. $\frac{1}{2}$

D. −¿1

40. If the line through **A(−¿1, 5)** and **B(2, t)** is perpendicular to the line through **C(2, 3)** and **D(0, 2),** then the value of **t** is:

A. −¿6 B. −¿11 C. −¿1

D. 0

41. If **P(2, 2)** is the mid-point of the line segment UV and **(−¿1, 5)** is coordinate of U, then what is the other coordinate V?

A. (−¿1, 5) B. (5, −¿1) C. (1, 5)

D. (5, 9)

42. If the coordinates of vertices of a triangle are $(1,2),(-3,4)$ and $(1,4)$**,** then what is the length of the shortest side of this triangle?

A. 4 B. 2 C. $2\sqrt{5}$

D. 1

43. What is the equation of straight lines if it has **x-**intercept **2** and **y-**intercept **3**?

A. $3x+2y-6=0$ B. $3x+2y+6=0$ C. $2x+3y-6=0$ D. $2x-3y+6=0$

44. A point p divides internally the line segment joining the points **(8, 9)** and **(−¿7, 4)** in the ratio of **2:3**. Then the point p is

A. ¿) B.($\frac{-3}{4},\frac{2}{5}$) C. (3, −¿4)

D. (2, 7)

45. If a line with X-intercept **8** and Y-intercept **10** is given, then its slope is

A. $\frac{5}{4}$ B. $\frac{4}{5}$ C. $\frac{-4}{5}$

D. $\frac{-5}{4}$

46. If lines l_1 and l_2 have parallel so that the equation of line $l_1$is $\frac{1}{2}y-x+2=0$, and line l_2 is passing through the point **(−¿1, 4),** then the equation of l_2 is:

A. y – 2x – 6 = 0 C. 2y – x – 4 = 0

B. y + 2x – 6 = 0 D. 2y + x – 4 = 0

47. On the coordinate plane, if p is a point between **A (2, −¿6), B(1, 8)** such that **AP: PB = 3:2**, then what are the coordinate of P?

A. $\left(\frac{7}{5},\frac{12}{5}\right)$ B. $\left(\frac{8}{5},\frac{-2}{5}\right)$ C. $\left(\frac{-14}{5},\frac{26}{5}\right)$ D. $\left(\frac{-6}{5},\frac{19}{5}\right)$

48. The distance between the point **(3, −¿2)** and **(6, 4)** is

A. $\sqrt{85}$ B. $\sqrt{79}$ C. $5\sqrt{3}$

D. $3\sqrt{5}$

49. In line segment $\overline{PQ}$ if point p is **(−¿2, 1)** and midpoint of $\overline{PQ}$is **(−¿1, 5)** the point **Q** is equal to

A. (0, 9) B. (−¿4, 9) C. (1, −¿1)

D. (1, 1)

50. If the lines **4y −¿ x −¿3 = 0** and **y −¿** $\frac{3}{a}$**x = 0** are perpendicular lines, then what is the value of$a$?

A. $\frac{-1}{2}$ B. $\frac{-3}{4}$ C. $\frac{1}{2}$

D. $\frac{3}{4}$

51. If the line through **A(−¿1, 2)** and **B(t, 1)** is perpendicular to the line **2x−¿ y+2=0,** then the value of **t** is:

A. −¿6 B. −¿1 C. 1

D. 0

52. Which one of the following is the value of the distance between **(2**$\sqrt{2}$**, −¿1)** and **(5**$\sqrt{2}$**, 2)?**

A. $3\sqrt{3}$Units B. $2\sqrt{5}$ Units C. $3\sqrt{2}$ units

D. None

53. What is the slope of straight line whose corresponding angle of inclination is **150?**

A. $\sqrt{3}$ B. $\frac{-\sqrt{3}}{3}$ C. $\frac{\sqrt{3}}{3}$

D. None

54. Which one of the following is an equation of straight line pass through the points **(**−¿**5, 1)** and **(2, 13)** A. −¿2x – y + 9 = 0

C. 2x + y + 9 = 0

B. 2x – y + 9 = 0 D. None

55. If the line $l_1$is passing through **(**−¿**4, 3)** and parallel to the line whose equation is −¿**6x + 2y + 3 = 0** then equation of$l_1$is ____

A. y = 3x + 15 B. y = −¿3x – 15 C. y = 3x + 4 D. y = −¿3x – 6

56. If the line whose equation is −¿**4x – y = 5** and the line L are perpendicular lines then which
are is the slope of L?

A. −¿ 4 B. 4 C. $\frac{-1}{4}$

D. $\frac{1}{4}$

57. If the line with equation **3x + 4ky – 2=0** and the line **8x = 3y** are perpendicular to each other then the value of k is

A. K = 4 B. k = 9 C. $\frac{-9}{32}$

D. k = 2

58. From question number **#57** what will be the value of "**K**" if two lines are parallel?

A. K = 4 B. k= 9 C. $\frac{-9}{32}$

D. k=2

59. If the two opposite vertices of a square are **(**−¿**1, 4)** and **(4,** −¿**1)** then the area of this square is _

A. 25 sq. Units B. $\frac{5}{2}$ sq. units C. $\frac{25}{2}$sq. units

D. $\frac{9}{2}$ sq. units

60. The equation of a line through **(2,** −¿**1)** and perpendicular to the line **2x+4y=0** is

A. x−¿2y+2=0 C. x+2y=0

B. −¿2x+y+5=0 D. −¿2x+y−¿4=0

Work Out.

1. Simplify each of the following expression.

A. $9^{1-\log_{243}^{32}}$ **E.** $e^{\ln 2x - \ln 4y}$ **I.** $\log_{\frac{1}{2}}^{8\sqrt[3]{2}} - \log_{4}^{\sqrt[3]{2}}$

B. $\ln\left(\frac{e^{4x}}{e^{2x}}\right)$ **F.** $\log_{27}^{\sqrt[3]{3}} + \log_{9}^{\sqrt[3]{9}}$ **J.** $\log_{10}^{5\sqrt{5}} + \log_{10}^{2\sqrt{20}}$

C. $e^{2x+\ln 2}$ **G.** $e^{\frac{1-\ln\left(\frac{1}{8}\right)}{3}}$ **K.** $\ln e^{x+lne}$.

$e^{lnx-\ln e}$

D. ¿¿¿ **H.** $\ln\sqrt[4]{e^2} - \ln e^2$ **L.** $\log_{10}^{\sqrt[3]{100}} + \log_{10}^{\sqrt[4]{100}}$

2. Solve each of the following equation

A. $4^{(2x^3)} = 16^{x}$ **E.** $10^{X} + 10^{X-1} = ¿0.0011$ **I.** $2x - ¿ 5 = e^{\ln(3-2x)}$

B. $4^{|x+1|} = 16^{|2x-3|}$ **F.** $(16^{x}) ¿ 9^{2x} = 36$ **J.** $e^{2x} + ¿ 5e^{x} = 6$

C. $e^{\ln(6-2x)} = 4x+3$ **G.** $3^{2x-2} ¿ 3^{2x+1} - 78$ **K.** $e^{\ln X^2} = 3x - ¿2$

D. $\sqrt[3]{225} = (27^{x})\ (125^{x})$ **H.** $e^{\ln(2x^2+6x)} = 8$ **L.** $\log_2 x + \log_2(x+2¿) = 3¿$

3. Use the table of logarithms to find

A. $\log 42{,}100$ B. $\log 2.354$ C. $\log 0.0342$ D. $\log 9{,}450$

4. If $\log 30 = 1.4771$ then evaluate:

A. $\log\left(\frac{1}{3}\right)$ B. $\log_{3}^{30}$ C. $\log_3 10$ D. $\log 0.003$

5. Sketch the graph of the following function in the same coordinate.

A. $f(x) = 1 + \left(\frac{1}{4}\right)^{-x}$ and $g(x) = 1 + 4^{x}$ D. $f(x) = e^{-2x}$ and $g(x) = e^{2x}$

B. $f(x) = 1 + \log_3 x$ and $g(x) = {}^{1+\log_{\frac{1}{3}} x}$ E. $f(x) = \ln\frac{1}{4}$ and $g(x) = \ln 4$

C. $f(x) = 1 + 2^{-x}$ and $g(x) = 1 + 2^{x}$ F. $f(x) = \log_3 x$ and $g(x) = \log_{\frac{1}{3}} x$

6. Solve each of the following Application of Exponential & Logarithmic Function

A. A Birr 1,000 deposits is made at a bank that pays 12% interest compounded monthly. How much will be in the account at the end of 10 years?

B. Suppose that the number of bacteria in a certain laboratory colony grows at the rate of 5% per day. If there are 1000 bacteria present initially, then what will be the number of bacteria present after: A. 1 day? B. 2 days? C. 10 days? D. n days?

C. If 2000 Birr is invested at 4% interest, compounded every year for 5 years, what is the amount realized at the end of 5 years?

D. The population of country A is 8.25×10^7 and that of country B is 1.11×10^8. If the annual growth of population of countries A and B are 5.2% and 2.6%, respectively, when will countries A and B have the same population?

II. Work Out (Assignment 5%).

1. Simplify and write each of the following using intervals:

A. $\{x: x \in R \text{ and } x \neq 4\}$

B. $\{x: x - 2 \geq 3\}$

C. $\{x: 2x + 1 \leq 4\}$

D. $\{x: 4x - 2 \leq -x\}$

E. $\{x: -4 \leq 3x + 1 \leq -2\}$

F. $\{x: -1 \leq x \leq 4\}$

G. $\{x: -1 \leq x + 3 \leq 2\}$

H. $\{x: x + 2 \geq 3\}$

I. $\{x: -1 \leq 2 - 3x \leq 4\}$

2. Solve each of the following absolute value inequalities and express their solution sets in intervals:

A. $|2 - 3x| + 4 \geq 2$

B. $|x + 4| - 3 \leq 0$

C. $|2x - 2| \leq 0$

D. $|3 - x| + 6 < 2$

E. $|x - 3| \geq 0$

F. $|1 - 3x| < 0$

G. $|1 - 2x| \geq 1$

H. $|2x + 1| \leq 3$

I. $|2 - 3x| > 0$

3. Draw the graphs of each of the following relations and find the **domain** and the **range**::

A. R={(x, y): x − y ≥ 2 and x + y ≤ 2}

B. R={(x, y): x ≤ y, y ≤ 1 and x + y ≤ 2}

C. R = {(x, y): y ≤ x and y ≥ 1 – x}

D. R={(x, y): y> x ≤ 2, y ≥ x– 2 and y ≤0}

E. R={(x, y): x − y ≤ 2 and x − y ≤ 2}

F. R={(x, y): y ≥ 1 , x ≤ 1 and 2x + y ≤ 2}

4. Solve each of the following system of linear inequalities graphically:

A. $\begin{cases} x-y\leq 0 \\ x+y\geq 2 \end{cases}$ **C.** $\begin{cases} 3x+6y>3 \\ x+2y<1 \end{cases}$ **E.** $\begin{cases} x-y\leq 1 \\ -x+y\geq -1 \end{cases}$

B. $\begin{cases} -x<1 \\ x-y\geq 1 \\ y>2 \end{cases}$ **D.** $\begin{cases} y\leq 2 \\ x\geq y \\ y>x+2 \end{cases}$ **F.** $\begin{cases} -x+y<1 \\ -x-y>1 \\ y\leq 2x \end{cases}$

5. Solve each of the following inequalities using product properties:

A. $x^2+10\geq 2-6x$ **C.** $x^2-26\leq 2+3x$ **E.** $(x-3)^2\leq 0$

B. $(x-1)^2\geq 0$ **D.** $(x-2)^2>0$ **F.** $x^2-6x-26\geq -2-4x$

6. Solve each of the following inequalities using sign charts:

A. $4x^2+16x+12>0$ **C.** $(1-x)^2-1<-1$ **E.** $2x^2+4x+6\geq 3x+12$

B. $4x-3x^2+9\geq 10x$ **D.** $x^2+15x+31\leq 2x-11$ **F.** $x^2+5x+6\geq 0$

7. Suppose the sum of two positive numbers x and y is less than **6** and greater than **2.** Show all possible values for x and y graphically.

8. For what value(s) of k does each of the following quadratic equations have

A. **One** real root? B. **Two** distinct real roots? C. **no** real roots?

i. $(\frac{k}{2}+2)x^2-(k+4)x+1=0$ **ii.** $x^2+(5-k)x+9=0$

9. A rocket is fired straight upward from ground level with an initial velocity of **480 km/hr.** After t seconds, its distance above the ground level is given by $480t-16t^2$. For what time interval is the rocket more than **3200km** above ground level?

10. For what value (s) of k is

i. $kx^2+6x+1>0$ for each real number x? **ii.** $x^2-9x+k<0$ only for $x\in(-2, 11)$?

11. The sum of a number x and twice another is **20.** If the product of these numbers is not more than 48, what are all possible values of x?

12. Give a pair of linear inequalities that describes the set of all points in the first quadrant.

13. What must the value(s) of k be so that:

A. $kx^2-10x-5\leq 0$ for all **x?**

B. $2x^2+(k-3)x+k-5=0$ I. has **one** real root? II. **Two** real roots? III. **No** real root?

14. A number y is **20** larger than a positive number x. If their sum is not more than **80,** what are the possible values of such number y?

15. The profit of a certain company is given by $\mathbf{P(x) = 10{,}000+¿350x\frac{-1}{2}x^2}$ where **x** is the amount (Birr in ten) spent on advertising. What amount gives a profit of more than Birr **40,000?**

16. Simplify and write each of the following using intervals:

D. $\{x: x\in R \text{ and } x\neq 4\}$

D. $\{x: 4x-¿2\leq -¿x\}$

G. $\{x: -¿1¿\ x+¿3\leq 2\ \}$

E. $\{x: x-¿2¿3\}$

E. $\{x: -¿4¿\ 3x+¿1 \leq -2\ \}$

H. $\{x: x+¿2\geq 3\}$

F. $\{x: 2x+¿1¿\ x \leq 4\ \}$

F. $\{x: -¿1¿\ x \leq 4\ \}$

I. $\{x: -¿1¿2-¿3x\ \leq 4\}$

17. Solve each of the following absolute value inequalities and express their solution sets in intervals:

D. $|2-3x|+4\geq 2$

D. $|3-x|+6<¿2$

G. $|1-2x|\geq 1$

E. $|x+4|-3\leq 0$

E. $|x-3|\geq 0$

H. $|2x+1|\leq 3$

F. $|2x-2|\leq 0$

F. $|1-3x|<¿0$

I. $|2-3x|>¿0$

18. Draw the graphs of each of the following relations and find the **domain** and the **range**::

D. $R=\{(x, y): x-¿y\geq 2 \text{ and } x+¿y¿2\}$

D. $R=\{(x, y): y> x \leq 2, y \geq x- 2 \text{ and } y \leq 0\}$

E. $R=\{(x, y): x¿y,\ y¿1 \text{ and } x+¿y\leq 2\}$

E. $R=\{(x, y): x-¿y¿2 \text{ and } x-¿y¿2\}$

F. $R = \{(x, y): y \leq x \text{ and } y \geq 1 - x\}$

F. $R=\{(x, y): y \geq 1 , x ¿1 \text{ and } 2x+¿y¿2\}$

19. Solve each of the following system of linear inequalities graphically:

C. $\begin{cases} x-y\leq 0 \\ x+y\geq 2 \end{cases}$

C. $\begin{cases} 3x+6y>3 \\ x+2y<1 \end{cases}$

E. $\begin{cases} x-y\leq 1 \\ -x+y\geq -1 \end{cases}$

D. $\begin{cases} -x<1 \\ x-y\geq 1 \\ y>2 \end{cases}$

D. $\begin{cases} y\leq 2 \\ x\geq y \\ y>x+2 \end{cases}$

F. $\begin{cases} -x+y<1 \\ -x-y>1 \\ y\leq 2x \end{cases}$

20. Solve each of the following inequalities using product properties:

C. $x^2+¿10 \geq 2-¿\ 6x$ C. $x^2-¿26 \leq 2+¿\ 3x$ E. $(x-¿3)^2 \leq 0$

D. $(x-¿1)^2 \geq 0$ D. $(x-¿2)^2\ ¿0$ F. $x^2-¿\ 6x-¿26 \geq -¿2-¿\ 4x$

21. Solve each of the following inequalities using sign charts:

C. $4x^2+¿\ 16x+¿\ 12¿0$ C. $(1-¿x)^2\ -¿\ 1\ ¿\ -¿1$ E. $2x^2\ +¿\ 4x+¿\ 6 \geq 3x+¿12$

D. $4x-¿3x^2+¿\ 9 \geq 10x$ D. $x^2+¿\ 15x+¿\ 31 \leq 2x-¿\ 11$ F. $x^2+¿\ 5x+¿\ 6 \geq 0$

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31. In each of the following, find the distance between the two given points.

A. **Q (0, $-\sqrt{2}$),** and **F ($\sqrt{2}$, 0),**

B. **G (−2, $\sqrt{2}$+1),** and **S (2, $\sqrt{2}$−1),**

C. **G ($\sqrt{2}$−1, 1),** and **R (1, $\sqrt{2}$+1),**

D. **R (1, −1),** and the **origin**

32. Find the equation of the line which passes through the points **P (−4, −2)** and **Q (3, 6).**

33. Find the coordinates of the mid-point of the line segments joining the points:

A. **R (6, 4), and y-**intercept is **2.**

B. **E (2, −2),** and the **origin**

C. **B (4, −1), and A (1, 0),**

D. **x-**intercept is **1.and A (3, −3),**

34. Find the coordinates of the three points that divide the line segment joining **P (−4, 7)** and **Q (10, −9)** into four parts of equal length.

35. Find the equation of the line passing through the given points.

A. **x-**intercept is **−1** and **y-**intercept is **3.**

B. **E (1, −2),** and the **origin**

C. **B (4, −1), and A (1, 0),**

D. **x-** intercept is **−2** and **A (1, −1),**

36. Let ℓ be the line through **A (−4, 5)** and **B (3, t)** that is perpendicular to the line through **P (1, 3)** and **Q (−4, 2).** Find the value of t.

37. Find the equation of the line with slope m, passing through the given point P.

A. **m=2; y-**intercept is **2.**

B. **m=−¿3;** the **origin**

C. **m=3; P (0, 2)**

D. **m=2; P ($\frac{2}{3}$, $\frac{1}{3}$)**

38. Let ℓ be the line through **A (4, −3)** and **B (t, −2)** that is parallel to the line through **P(−2, 4)** and **Q (4, −1).** Find the value of **t**

39. Find the equation of the line with slope m and y-intercept b.

A. **m=2; y-**intercept is **1.**

B. **m=−¿3; b =−¿2**

C. **m=π; b= 2**

D. **m=2; b= $\frac{-2}{3}$,**

40. Find the equation of the straight line passing through **P (-2, 1)** and:

A. parallel to the line with equation **2x- 3y=1**

B. Perpendicular to the line with equation **5y+6x= 10**.

41. For each of the following equations, find the slope and y-intercept:

A. $-¿2x+¿\ 3y+¿\ 6 = -¿4x$ **C. 2(x+¿ 4)** $+¿6y = -¿3x$

B. $-¿x+¿\ 6 = 5(x+¿2)+¿\ 3y$ **D.** $\frac{-2}{3}y+¿\ 2x$ $+¿6 = 5x$

Work Out.

7. Simplify each of the following expression.

E. $9^{1-\log_{243}^{32}}$ **E.** $e^{\ln 2x-\ln 4y}$ **I.** $\log_{\frac{1}{2}}^{8\sqrt[3]{2}}-\log_{4}^{\sqrt[3]{2}}$

F. $\ln\left(\frac{e^{4x}}{e^{2x}}\right)$ **F.** $\log_{27}^{\sqrt[3]{3}}+\log_{9}^{\sqrt[3]{9}}$ **J.** $\log_{10}^{5\sqrt{5}} + \log_{10}^{2\sqrt{20}}$

G. $e^{2x+\ln 2}$ **G.** $e^{\frac{1-\ln\left(\frac{1}{8}\right)}{3}}$ **K.** $\ln e^{x+lne}$. $e^{lnx-\ln e}$

H. ¿¿¿ **H.** $\ln\sqrt[4]{e^2}-\ln e^2$ **L.** $\log_{10}^{\sqrt[3]{100}}+\log_{10}^{\sqrt[4]{100}}$

8. Solve each of the following equation

E. $4^{(2x^3)} = 16^x$ **E.** $10^X+10^{X-1}=¿0.0011$ **I.** $2x -¿ 5= e^{\ln(3-2x)}$

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H. $\sqrt[3]{225} = (27^x)\ (125^x)$ **H.** $e^{\ln(2x^2+6x)}=8$ **L.** $\log_2 x+\log_2(x+2¿)=3¿$

9. Use the table of logarithms to find

B. $\log 42{,}100$ B. $\log 2.354$ C. $\log 0.0342$ D. $\log 9{,}450$

10. If $\log 30 = 1.4771$ then evaluate:

B. $\log\left(\frac{1}{3}\right)$ B. $\log_3^{30}$ C. $\log_3 10$ D. $\log 0.003$

11. Sketch the graph of the following function in the same coordinate.

D. $f(x)= 1+\left(\frac{1}{4}\right)^{-x}$ and $g(x) = 1+4^{x}$

D. $f(x)= e^{-2x}$ and $g(x) = e^{2x}$

E. $f(x)=1+\log_3 x$ and $g(x) = 1+\log_{\frac{1}{3}} x$

E. $f(x)= \ln\frac{1}{4}$ and $g(x) = \ln 4$

F. $f(x)= 1+2^{-x}$ and $g(x) = 1+2^{x}$

F. $f(x)= \log_3 x$ and $g(x) = \log_{\frac{1}{3}} x$

12. Solve each of the following Application of Exponential & Logarithmic Function

E. A Birr 1,000 deposits is made at a bank that pays 12% interest compounded monthly. How much will be in the account at the end of 10 years?

F. Suppose that the number of bacteria in a certain laboratory colony grows at the rate of 5% per day. If there are 1000 bacteria present initially, then what will be the number of bacteria present after: A. 1 day? B. 2 days? C. 10 days? D. n days?

G. If 2000 Birr is invested at 4% interest, compounded every year for 5 years, what is the amount realized at the end of 5 years?

H. The population of country A is 8.25×10^7 and that of country B is 1.11×10^8. If the annual growth of population of countries A and B are 5.2% and 2.6%, respectively, when will countries A and B have the same population?