

Directions: Show all Work! Place your answers on the space provided.

Select all that is applicable:

1.  $\sqrt{2}$

1. Real number, Irrational number

Real number, Irrational number, Rational number, Integer, Whole number, Natural numbers

2.  $-\frac{13}{7}$

2. Real number, Rational number

Real number, Irrational number, Rational number, Integer, Whole number, Natural numbers

3. Let  $f(x) = 3x + 2$  and  $g(x) = 7x + 6$ . Find  $f \cdot g$  and its domain.

3.  $21x^2 + 32x + 12$ , Domain: All real numbers

4. Let  $f(x) = 3x - 6$  and  $g(x) = x - 2$ . Find  $\frac{f}{g}$  and its domain.

4. 3, Domain: All real numbers,  $x \neq 2$

Write the expression as a single logarithm

5.  $4\log x - 6\log(x + 2)$

5.  $\log \frac{x^4}{(x+2)^6}$

6. Solve  $\frac{1}{16} = 64^{4x-3}$

6.  $\frac{7}{12}$

7. Solve  $125^{9x-2} = 150$ . Round answer to the nearest ten-thousandth.

7. .3375

8. Solve  $3\log 2x = 4$ . Round answer to the nearest ten-thousandth.

8. 10.7721

9. Solve  $\log(x + 9) - \log x = 3$ . Leave your answer in simplest form of fraction.

9.  $\frac{1}{111}$

10. Simplify  $\ln e^3$

10. 3

11. The sales of lawn mowers  $t$  years after a particular model is introduced is given by the function  $y = 5500 \ln(9t + 4)$ , where  $y$  is the number of mowers sold. How many mowers will be sold 2 years after a model is introduced? Round the answer to the nearest whole number.

11. # of mowers sold are 17001

12. A football was kicked vertically upward from a height of 4 feet with an initial speed of 60 feet per second. The formula  $h = 4 + 60t - 16t^2$  describes the ball's height above the ground,  $h$ , in feet,  $t$  seconds after it was kicked. What was the ball's height 3.2 seconds after it was kicked?

12. 32.16 ft

13. Evaluate the expression.

$$\frac{7(x-3)}{2x-16}; x=9$$

13. 21

14. Find the distance between  $a$  and  $b$ ,  $a = -2.57$  and  $b = 9.23$

14. 11.8

15. Use absolute notation to describe the distance between  $a$  and 7 is no more than 9.

15.  $|a-7| \leq 9$

16. If  $f(x) = 2x - 3$  and  $g(x) = -5x + 1$ , find the value of  $\frac{f(5)}{g(-3)}$ .

16.  $\frac{7}{16}$

For problem # 17 - 19, graph the equations on the coordinate planes provided at the end of the packet.

17. Find the slope of the line  $x = 5$ . Graph it on the coordinate plane.

17. **undefined**

18. Find the equation of a line in slope intercept form, passing through (2, 5) and parallel to  $2x + 3y = -12$ . Graph the given line and the line parallel to it on the coordinate plane.

18.  $y = -\frac{2}{3}x + \frac{19}{3}$

19. Find the equation of line in standard form, passing through (-6, 4) and perpendicular to  $3x + 4y = 7$ . Graph the given line and the line perpendicular to it on the coordinate plane.

19.  **$4x - 3y = -12$**

For problem # 20 and 21 write the equation in Logarithmic form.

20.  $6^4 = 1,296$

20.  $\log_6 1296 = 4$

21.  $125^{\frac{4}{3}} = 625$

21.  $\log_{125} 625 = \frac{4}{3}$

For problem # 22 and 23 evaluate.

22.  $\log_5 \frac{1}{625}$

22. **-4**

23.  $\log 0.01$

22. **-2**

For problem # 24 -32, factor the following expressions:

24.  $5x^2 + 15x$

24.  **$5x(x + 3)$**

25.  $10x^3 - 4x^2$

25.  **$2x^2(5x - 2)$**

26.  $2x(x - 7) + 3(x - 7)$

26.  $(x - 7)(2x + 3)$

27.  $x^3 + 4x^2 + 3x + 12$

27.  $(x + 4)(x^2 + 3)$

28.  $x^2 + 3x - 18$

28.  $(x + 6)(x - 3)$

29.  $8x^2 - 10x - 3$

29.  $(4x + 1)(2x - 3)$

30.  $6x^2 + 19x - 7$

30.  $(3x - 1)(2x + 7)$

31.  $x^2 - 4$

31.  $(x - 2)(x + 2)$

32.  $81x^2 - 49$

32.  $(9x - 7)(9x + 7)$

33. Solve by factoring.

$6x^2 - 17x + 12 = 0$

33.  $x = \frac{3}{2}, \frac{4}{3}$

34. Solve the equation by using quadratic formula, leave answer in simplest form of radical.

$2x^2 - 6x + 1 = 0$

34.  $\frac{3 \pm \sqrt{7}}{2}$

**Simplify the following expressions.**

35.  $5(2x^2 - 6x) - (4x^2 - 3x)$

35.  $6x^2 - 27x$

36.  $\frac{30x^3y^4}{6x^9y^{-4}}$

36.  $\frac{5y^8}{x^6}$

37.  $\sqrt{128x^7y^4}$

37.  $8x^3y^2\sqrt{2x}$

38.  $81^{\frac{3}{4}}$

38. 27

39.  $\sqrt{6r}\sqrt{3r}$

39.  $3r\sqrt{2}$

40.  $4\sqrt{50}-3\sqrt{18}$

40.  $11\sqrt{2}$

41.  $\frac{3}{5+\sqrt{2}}$

41.  $\frac{3(5-\sqrt{2})}{23}$

42.  $\frac{x^2+2x-3}{x^2-3x+2}$

42.  $\frac{(x+3)}{(x-2)}$

43.  $(2x-5)(x^2-4x+3)$

43.  $2x^3 - 13x^2 + 26x - 15$

44.  $(5x+3y)^2$

44.  $25x^2 + 30xy + 9y^2$

45.  $\frac{x^2}{2} \div \frac{x}{4}$

45. 2x

46.  $3^{\frac{1}{3}} \cdot 9^{\frac{1}{3}}$

46. 3

47.  $(8-\sqrt{2})(9+\sqrt{5})$

47.  $72+8\sqrt{5}-9\sqrt{2}-\sqrt{10}$

Solve the equation and check for extraneous solutions.

48.  $\sqrt{x+10} - 7 = -5$

$x = -6$

Extraneous solution if any none

49. For the function  $f(x) = x^2 - 6x + 5$

Find the following and graph the function:

a. axis of symmetry

$x = 3$

b. coordinates of vertex

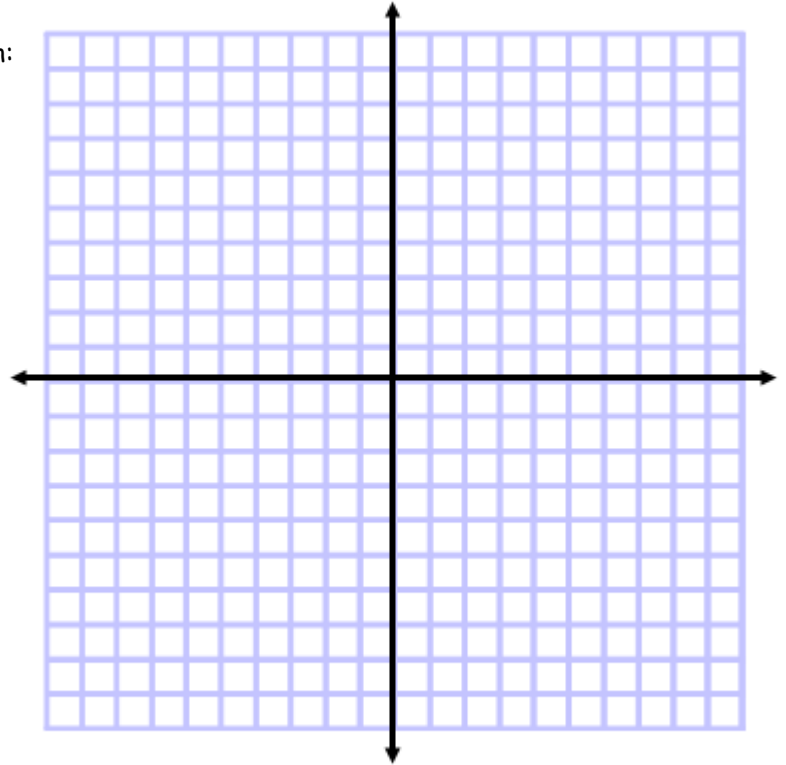
$(3, -4)$

c. x-intercept

$(5, 0)$  and  $(1, 0)$

d. Y-intercept

$(0, 5)$



50. Solve the following inequalities algebraically and graphically and write your answer using interval notation:

$3x - 2 < 4$  and  $-4x - 3 \leq 9$



$[-3, 2)$