

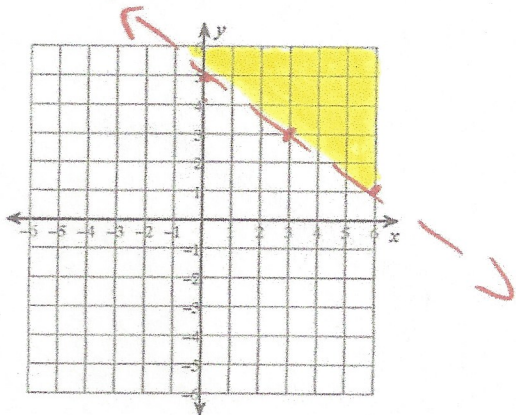
Final Review

Evaluate each function.

1)  $f(n) = |n + 1| + 1$ ; Find  $f(4)$   $f(4) = |4 + 1| + 1 = 6$

Sketch the graph of each linear inequality.

2)  $y > -\frac{2}{3}x + 5$



Write the slope-intercept form of the equation of the line through the given points.

3) through:  $(0, -4)$  and  $(-5, 1)$   $m = \frac{1 - (-4)}{-5 - 0} = \frac{5}{-5} = -1$   $y = -x - 4$

Solve each system by elimination.

4)  $\begin{cases} -9x + 5y = 21 \\ -7x + 10y = -2 \end{cases}$   
 $\rightarrow \begin{cases} 18x - 10y = -42 \\ -7x + 10y = -2 \end{cases}$   
 $\frac{25x}{10} = -40$   
 $5x = -40$   
 $x = -8$   
 $y = -3$   
 $(-8, -3)$

Solve each system by substitution.

5)  $\begin{cases} -7x + 4y = 16 \\ -6x + y = 21 \end{cases}$   
 $\rightarrow \begin{cases} -7x + 4(6x + 21) = 16 \\ -6x + y = 21 \end{cases}$   
 $24x + 84 = 16$   
 $24x = -68$   
 $x = -4$   
 $y = -3$   
 $(-4, -3)$

Simplify. Your answer should contain only positive exponents.

6)  $\frac{2yz^2z^3}{y^2z^3 \cdot 4y^2} = \frac{x^2}{2y^3}$

Divide.

7)  $(x^5 - 8x^4 - 6x^3 - 25x^2 - 23x + 45) \div (x - 9)$

9		-8	-6	-25	-23	45
		9	9	27	18	-45
-1		1	3	2	-5	0

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

Find each product.

8)  $2x^2(4x^2 - 4xy + 5y^2)$   
 $8x^4 - 8x^3y + 10x^2y^2$

9)  $(p-5)(p-4)$   
 $p^2 - 9p + 20$

10)  $x^2 = -4x - 4$

$x^2 + 4x + 4 = 0$   $(x+2)(x+2) = 0$   $| x = -2$

Solve each equation. Remember to check for extraneous solutions.

11)  $-10\sqrt{2n} = -20$   $\sqrt{2n} = 2$   $2n = 4$   $| n = 2$

Write a polynomial function of least degree with integral coefficients that has the given zeros.

12) 4, 5, 2  $(x-4)(x-5)(x-2) \rightarrow x^3 - 7x^2 + 10x - 40$   
 $(x-4)(x^2 - 7x + 10) \rightarrow x^3 - 11x^2 + 38x - 40$

Condense each expression to a single logarithm.

13)  $8\log_8 x + 2\log_8 y = \log_8 x^8 + \log_8 y^2 = \log_8 x^8 y^2$

Expand each logarithm.

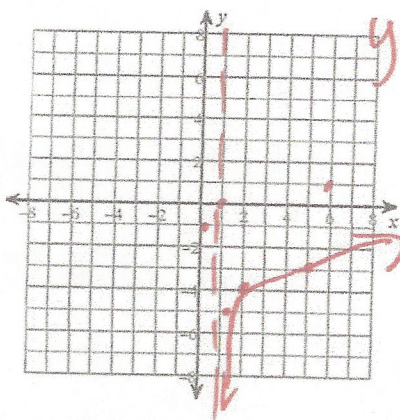
14)  $\log_5 (xy^2)^4 = \log_5 x^4 + \log_5 y^8 = 4\log_5 x + 8\log_5 y$

Solve each equation.

15)  $\log_6 (x+1) + \log_6 4 = 2$   $\log_6 (x+1)4 = 2$   $4x + 4 = 36$   
 $4(x+1) = 6^2$   $4x = 32$   
 $x = 8$

Identify the domain and range of each. Then sketch the graph.

16)  $y = \log_6 (x-1) - 4$



$y = \log_6 x \rightarrow | \downarrow 4$

x	y
1/6	-1
1	0
6	1

$6^y = x$

D:  $(1, \infty)$   
R:  $(-\infty, \infty)$

Rewrite each equation in exponential form.

17)  $\log_{12} 144 = 2$   $12^2 = 144$

Simplify each expression.

$$18) \frac{4x}{x+3} + \frac{5}{x-3} = \frac{4x(x-3)}{(x+3)(x-3)} + \frac{5(x+3)}{(x+3)(x-3)} = \frac{4x^2 - 12x + 5x + 15}{(x+3)(x-3)} = \frac{4x^2 - 7x + 15}{(x+3)(x-3)}$$

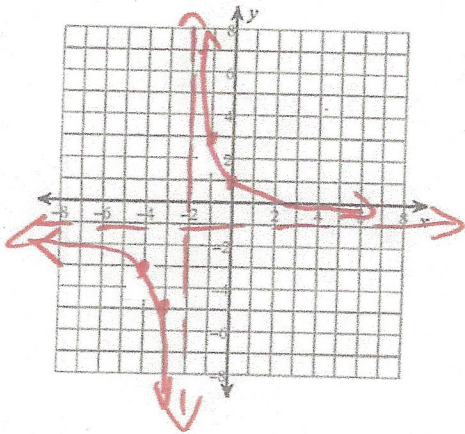
Solve each equation. Remember to check for extraneous solutions.

$$19) \frac{1}{3} - \frac{2}{n} = \frac{1}{n} \quad \frac{n}{3n} - \frac{6}{3n} = \frac{3}{3n}$$

$$n - 6 = 3 \quad \boxed{n = 9}$$

Identify the vertical asymptotes, horizontal asymptote, domain, and range of each. Then sketch the graph.

$$20) f(x) = \frac{4}{x+2} - 1$$



V.A.  $x = -2$     D:  $x \neq -2$   
 H.A.  $y = -1$     R:  $y \neq -1$

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

Simplify each expression.

$$21) \frac{n^2 + 12n + 20}{n+2} \cdot \frac{n-5}{n+10} = \frac{(n+10)(n+2)}{(n+2)} \cdot \frac{(n-5)}{(n+10)} = \boxed{(n-5)}$$

Given two terms in an arithmetic sequence find the rule for the nth term and the 37th term.

$$22) a_{11} = -65 \text{ and } a_{33} = -263$$

Find  $a_{37}$

$$d = \frac{-263 - (-65)}{33 - 11} = \frac{-198}{22} = -9$$

$$-65 = a_1 + 10(-9)$$

$$25 = a_1$$

$$a_n = 25 + (n-1)(-9)$$

$$a_{37} = -299$$

Evaluate each arithmetic series described.

$$23) \sum_{m=1}^9 (6m - 8)$$

(Sum)

$$a_1 = -2$$

$$a_9 = 46$$

$$S_9 = 9 \left( \frac{-2 + 46}{2} \right) = 198$$

Evaluate each geometric series described. (Sum)

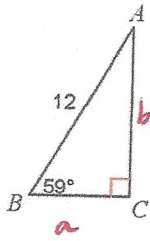
$$24) -2 - 8 - 32 - 128 \dots, n = 6$$

$$r = 4$$

$$S_n = -2 \left( \frac{1 - (4)^6}{1 - 4} \right) = -2730$$

Solve each triangle. Round sides to the nearest tenth and angles to the nearest degree.

25)



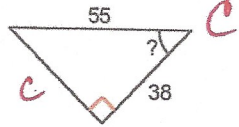
$$\sin 59 = \frac{b}{12}$$

$$b \approx 10.3$$

$$a \approx 6.2$$

$$m\angle A = 31^\circ$$

26)



$$\cos C = \frac{38}{55}$$

$$m\angle C \approx 46^\circ$$

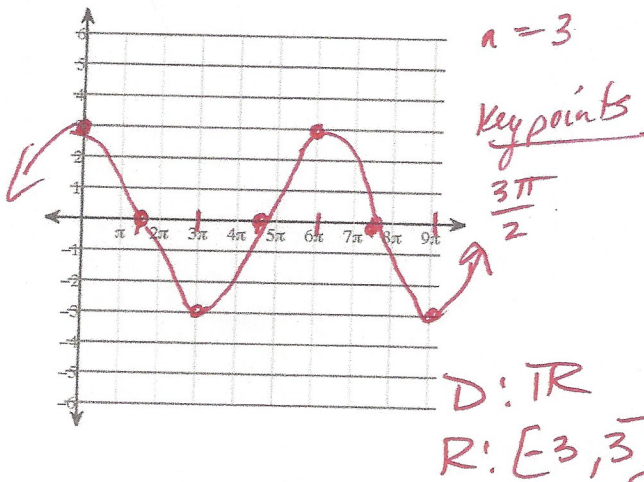
$$m\angle A \approx 44^\circ$$

$$c \approx 39.8$$

Graph each function using radians. Identify Domain & Range.

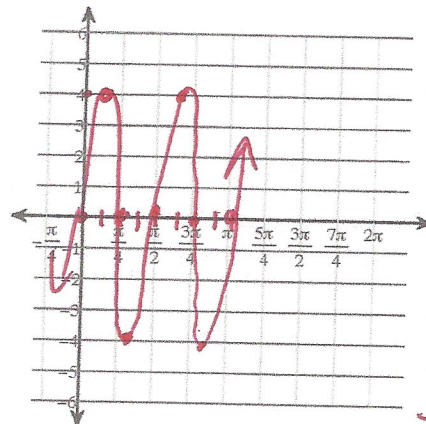
27)  $y = 3\cos \frac{\theta}{3}$

$$P = \frac{2\pi}{1/3} = 6\pi$$



28)  $y = 4\sin 4\theta$

$$P = \frac{2\pi}{4} = \frac{\pi}{2}$$



D:  $\mathbb{R}$   
R:  $[-4, 4]$

Convert each degree measure into radians and each radian measure into degrees.

29)  $-\frac{23\pi}{6} \cdot \frac{180}{\pi} = -690^\circ$

30)  $345^\circ \cdot \frac{\pi}{180} = \frac{23\pi}{12}$

31) A normal distribution has a mean of 186.4 and a standard deviation of 48.9.

a) What range of values represents the middle 99.7% of the data?  $39.7$  to  $333.1$

b) What percent of data will be more than 235.3?

$16\%$

32) TEMPERATURE The daily July surface temperature of a lake at a resort has a mean of  $82^\circ$  and a standard deviation of  $4.2^\circ$ . If you prefer to swim when the temperature is at least  $80^\circ$ , about what percent of the days does the temperature meet your preference?

$68.4\%$

$$\frac{80 - 82}{4.2} = -0.476$$