Math 60 Review Session Practice Questions

rev. November 2019

Evaluate the expression if possible.

1.) $\sqrt[5]{243}$

a) 9 b) -3 c) 3 d) $\sqrt[5]{243}$ e) none of these

Solve the equation.

2.) -5x + 3 = 6 – (x – 5)

a) -4 b) $-\frac{14}{4}$ c) -2 d) 5 e) none of these

Find the domain of the rational expression.

3.) $\frac{5y+3}{y^3-5y^2-24y}$

a) $\left\{y\middle|y \neq -\frac{3}{5}\right\}$ b) $\left\{y\middle|y \neq -3,-\frac{3}{5},\ 0,8\right\}$ c)$\{y|y \neq -3,0,8\}$ d)$\{y|y \neq 0\}$ e) none of these

Solve.

4.) $9^{X-1} = 27^{X}$

a) x = 1 b) x = 3 c) x = -1 d) x = -2 e) none of these

Write an equation of a line.

5.) Write the equation of line with a slope of $\frac{1}{2}$ and containing the point (-6, 2).

a) $y = \frac{1}{2}x - 1$ b) $y = \frac{1}{2}x - 10$ c) $y = \frac{1}{2}x + 5$ d) $y = 2x - 8$ e) none of these

Simplify the complex rational expression.

6.) $\frac{\frac{x^3}{x^2-9}}{\frac{x^3-8x^2}{x^2+5x-24}}$

a) $\frac{x^5(x-8)}{(x+3)(x+8)(x-3)^2}$ b) $\frac{x(x+8)}{(x+3)(x-8)}$ c) $-\frac{x(x+8)}{(x+3)(x-8)}$ d) $\frac{x(x-8)}{(x+3)(x+8)}$ e) none of these

Simplify.

7.) $\frac{m^2-4}{m^2+6m-16} \cdot \frac{m-2}{16+6m-m^2}$

a) $-\frac{m-2}{(m+8)(m-8)}$ b) $\frac{m+2}{(m+8)(m-8)}$ c) $-\frac{m-2}{m^2}$ d) $\frac{m-2}{(m+8)(m-8)}$ e) none of these

Perform the indicated operation. Simplify if possible. Assume all variables are positive.

8.) $\frac{\frac{10x^5}{8x^2}}{\frac{6x^3}{40x^6}}$

$a)$ $\frac{1}{8}$ $b)$ $\frac{25x^8}{3}$ c) $\frac{100x^6}{12}$ d) $\frac{25x^6}{3}$ e) none of these

Add.

9.) $10y^3 - y^2 + 4y - 11 \; and \; -4y^2 + 3y + y^3$

a) $10y^3 - 3y^2 + 7y - 11$ b) $11y^3 - 5y^2 + 7y - 11$ c) $9y^3 - 5y^2 + 7y - 11$
d) $11y^3 - 4y^2 + 4y - 11$ e) none of these

Perform the indicated operation. Simplify if possible.

10.) $\frac{7k^2-2}{k-2} - \frac{7k+7}{2-k}$

a) $\frac{7k^2+7k+5}{2k}$ b) $-\frac{7k^2+7k+5}{k-2}$ c) $\frac{7k^2+7k+5}{k-2}$ d) $\frac{7k^2-7k+9}{k-2}$ e) none of these

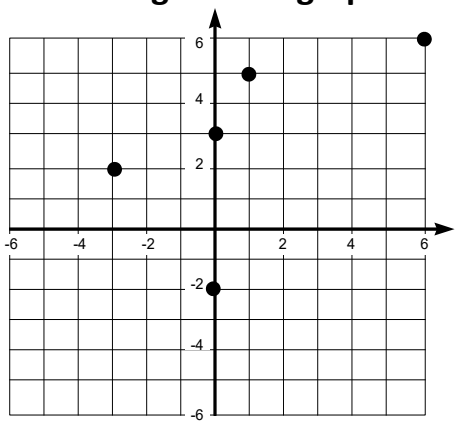
Solve the equation using the quadratic formula.

11.) $m^2 + 12m + 15 = 0$

a) $\{-6+\sqrt{21}, -6-\sqrt{21}\}$ b) $\{6+\sqrt{21}, 6-\sqrt{21}\}$ c) $\{6+\sqrt{15}, 6-\sqrt{15}\}$
d) $\{-12+\sqrt{15}, -12-\sqrt{15}\}$ e) none of these

Find the domain and the range of the graph below.

12.)



a) D: {-2,2,3,5,6} R: {-3, 0, 1, 6} b) D: [-3,6] R: [-2,6] c) D: [-2,6] R: [-3,6] d) D: {-3, 0, 1, 6} R: {-2,2,3,5,6} e) none of these

Solve using system of equations.

13.) Two cars leave Indianapolis, one traveling east and the other west. After 3 hours they are 297 miles apart. If one car is traveling 5 mph faster than the other, what is the speed of each?

a) slow car 45 mph fast car 50 mph b) slow car 50mph fast car 55 mph c) slow car 47 mph fast car 52 mph d) slow car 49 mph fast car 54 mph e) none of these

Find the domain of the function.

14.) $f(x) = \frac{3x+4}{x^2+7x+6}$

a) $\{x|x \neq -1\}$ b) $\{x|x \neq 6\}$ c) $\{x|x \neq -1, 6\}$ d) $\{x|x \neq -1, -6\}$ e) none of these

Solve the system by any method.

15.) $\begin{cases} \frac{1}{8}x + \frac{1}{2}y = \frac{1}{8} \\ -3x - 8y = 0 \end{cases}$

a) $\left(\frac{3}{4}, -2\right)$ b) $\left(2, \frac{3}{4}\right)$ c) $\left(-2, \frac{3}{4}\right)$ d) $\left(2, -\frac{3}{4}\right)$ e) none of these

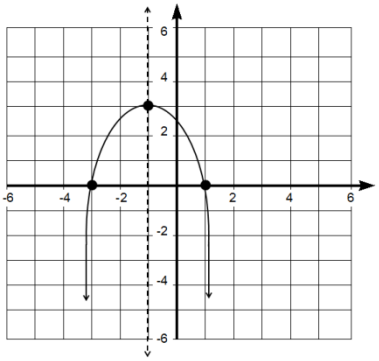
Solve the formula for the indicated variable.

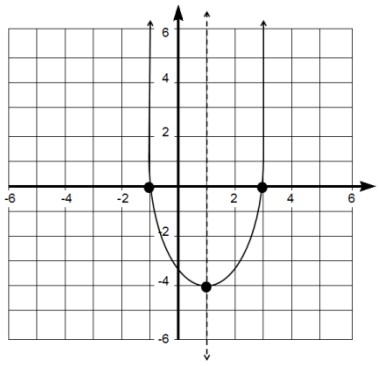
16.) $P = \frac{A}{1+rt}$ solve for *r*.

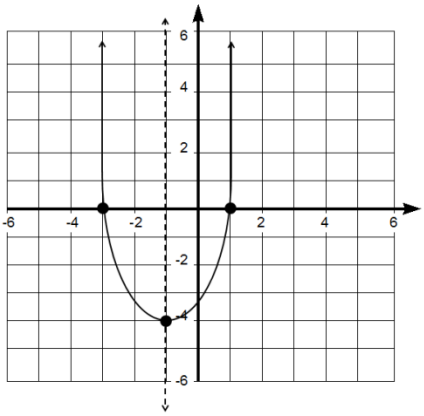
a) $r = \frac{A-P}{Pt}$ b) $r = \frac{P-1}{At}$ c) $r = P - At$ d) $r = \frac{P-A}{1+t}$ e) none of these

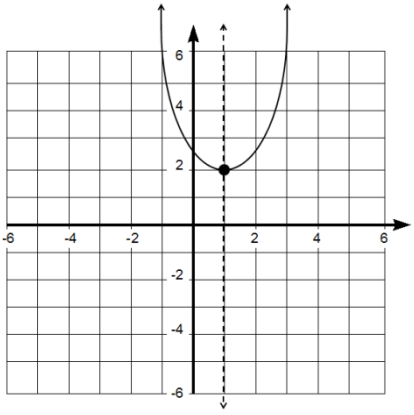
Graph the quadratic function.

17.) $h(x) = x^2 - 2x - 3$

a) 

b) 

c) 

d) 

e) none of these

Solve the system of equations.

18.) $\begin{cases} y = \frac{1}{4}x \\ 2x - 4y = 3 \end{cases}$

a) $\left(3, \frac{3}{4}\right)$ b) $\left(-3, \frac{3}{4}\right)$ c) $\left(-3, -\frac{3}{4}\right)$ d) $\left(3, -\frac{3}{4}\right)$ e) none of these

Solve.

19.) A salesperson earns $600 per month plus a commission of 20% of sales. Find the amount of sales needed to receive a total income of $1500 per month.

a) $1125 b) $2625 c) $4500 d) $10,500 e) none of these

Rewrite the expression with a positive rational exponent. Simplify, if possible. Assume that a and b are greater than zero.

20.) $\left(\frac{27a^3b^{-6}}{a^{-3}b^6}\right)^{\frac{1}{3}}$

a) $\frac{3a^2}{b^4}$ b) $\frac{9a}{b^2}$ c) $3a^2b^6$ d) $\frac{9b^2}{a}$ e) none of these

Solve the problem.

21.) It took the Selby family 5 ½ hours to drive round-trip from their house to their beach house 154 miles away. Find their average speed,

a) 55 mph b) 56 mph c) 65 mph d) 60 mph e) none of these

Solve the problem.

22.) Karen bought some large frames for $15 each and some small frames for $8 each at a closeout sale. If she bought 22 frames for $239, find how many of each she bought.

a) 13 small, 9 large b) 11 small, 11 large c) 2 small, 20 large d) 7 small, 15 large e) none of these

Solve the problem.

23.) The width of a rectangle is 4 cm less than its length. If its area is $96\ cm^2$, what is the perimeter?

a) 48 cm b) 20 cm c) 24 cm d) 40 cm e) none of these

24.) Shelly can cut a lawn with a riding mower in 2 hours less time than it takes William to cut the lawn with a push mower. If they can cut the lawn in 4 hours working together find how long to the nearest tenth of an hour it takes for William to cut the lawn alone?

a) 7.1 hrs b) 9.1 hrs c) 9.2 hrs d) 7.2 hrs e) none of these

Find the quotient and simplify.

25.) $\frac{p^2-12p+pq-12q}{3p^2-3q^2} \div \frac{p-12}{8p-8q}$

a) $\frac{(p-12)^2}{24(p-q)^2}$ b) $\frac{8(p^2-12p+pq-12q)}{3(p+q)(p-12)}$ c) $\frac{8}{3}$ d) 1 e) none of these

Subtract.

26.) Subtract $3a^2b^3 - 4ab^2 + 6a$ from $7a^2b^3 - ab^2$

a) $10a^2b^3 - 5ab^2 - 6a$ b) $-10a^2b^3 + 5ab^2 - 6a$ c) $4a^2b^3 + 3\,ab^2 - 6a$
d) $-4a^2b^3 + 3ab^2$ e) none of these

Perform the indicated operations and simplify.

27.) $\sqrt{2} - 4\sqrt{18} - 7\sqrt{32}$

a) $-11\sqrt{2}$ b) $-11\sqrt{52}$ c) $-39\sqrt{2}$ d) $-39\sqrt{52}$ e) none of these

Solve the equation.

28.) $x^2 - 10x - 96 = 0$

a) $\{-6, 16\}$ b) $\{-16,6\}$ c) $\{4,\ 3\}$ d) $\{-4,\ 3\}$ e) none of these

Simplify the rational expression.

29.) $\frac{x^3+7x^2+10x}{x^2+9x+14}$

a) $\frac{x+5}{x(x+7)}$ b) $\frac{x^3+7x^2+10x}{x^2+9x+14}$ c) $\frac{x(x+5)}{x+7}$ d) $\frac{x+5}{x+7}$ e) none of these

Simplify the expression. Assume all variable represent positive real numbers.

30.) $\frac{\sqrt{16x^7y^{10}}}{\sqrt{xy^{16}}}$

a) $\frac{4x^6}{y^6}$ b) $\frac{4\sqrt{x^6}}{y^6}$ c) $4x^3y^3$ d) $\frac{4x^3}{y^3}$ e) none of these

Perform the indicated operation. Simplify if possible.

31.) $\frac{x}{x^2-25} + \frac{5}{x+5} = \frac{6}{x}$

a) x = -6 b) x = -5, 2 c) x = 5,2 d) x = 6 e) none of these

Solve the problem.

32.) If $f(x) = 4x^2 - 6x + 3$, $find\ f(-1)$.

a) -5 b) -7 c) 13 d) 5 e) none of these

Multiply, and then simplify if possible.

33.) $\left(8\sqrt{5} + 7\right)^2$

a) $369 - 112\sqrt{5}$ b) $271 + 112\sqrt{5}$ c)$369 + 112\sqrt{5}$ d) $327 + 112\sqrt{5}$ e) none of these

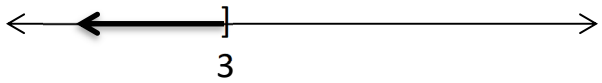
Solve the problem.

34.) Lynn, a pharmacist, needs 70 liters of a 50% alcohol solution She has available a 30% alcohol solution and an 80% alcohol solution. How many liters of each solution should she mix to obtain 70 liters of a 50% alcohol solution?

a) 26 L of 80% solution b) 28 L of 80% solution c) 24 L of 80% solution d) 32 L of 80% solution
44 L of 30% solution 42 L of 30% solution 46 L of 30% solution 38L of 30% solution
e) none of these

Solve the inequality. Graph the solution set and write the solution set in set-builder notation.

35. $4x - 12 \leq 0$

a) 

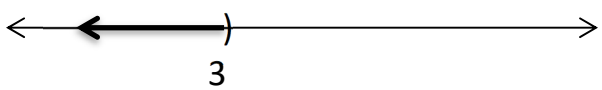
$\{x|x \leq 3\}$

b) 

$\{x|x \geq -3\}$

c) 

$\{x|x \geq 3\}$

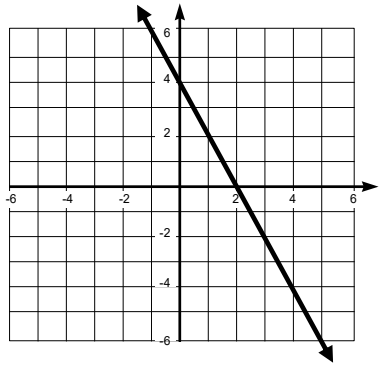
d) 

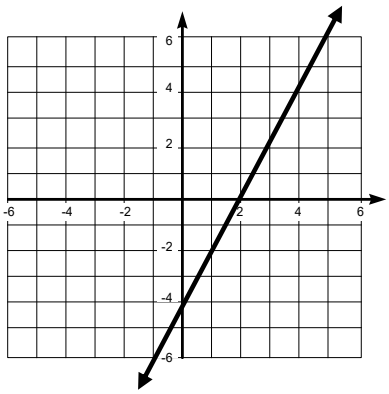
$\{x|x \leq 3\}$

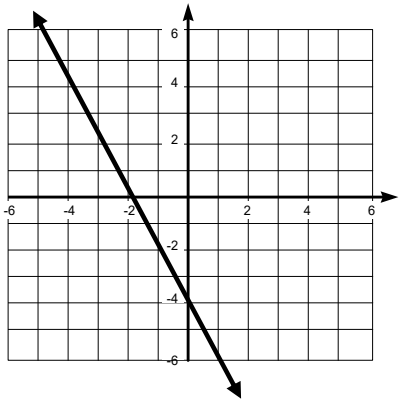
e) none of these

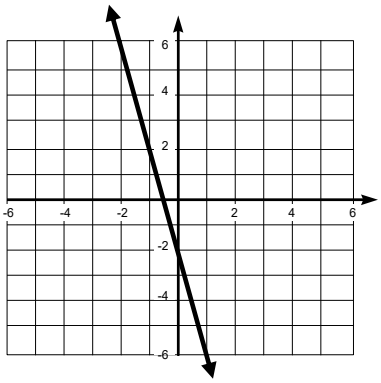
Graph the linear function.

36.) $f(x) = -2x - 4$

a) 

b) 

c) 

d) 

e) none of these

Subtract.

37.) $(12z^5 - 12z^3 + z) - (-3z^4 + z^3 + 12z)$

a) $(15z^9 - 13z^6 - 11z)$

b) $(12z^5 - 3z^4 - 11z^3 - 11z)$

c) $(12z^5 + 3z^4 - 13z^3 - 11z)$

d) $(9z^4 - 11z^3 + 13z)$

e) none of these

Solve the problem.

38.) The value of a $22,500 car after x years is given by the function $V(x) = 22{,}500 - 4500x$. What is the value of the car after 5 years?

a) $9,000 b) $17,995 c) $0 d) $4,500 e) none of these

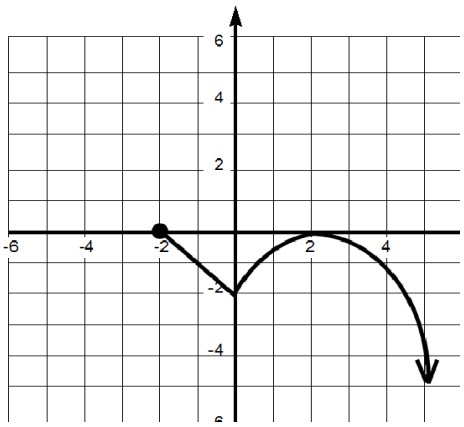
Perform the indicated operation.

39.) $\frac{3x}{x^2-25} + \frac{1}{3x+15}$

a) $\frac{3x+1}{3(x+5)(x-5)}$ b) $\frac{8x-5}{3(x+5)(x-5)}$ c) $\frac{x+1}{(x+5)(x-5)}$ d) $\frac{5(2x-1)}{3(x+5)(x-5)}$ e) none of these

Find the domain and the range.

40.)



a) domain: $\{x|x \leq 0\}$ range: $\{y|y \geq -2\}$

b) domain: $\{x|x \geq -2\}$ range: $\{y|y \leq 0\}$

c) domain: $\{x|x\ is\ a\ real\ \#\}$ range: $\{y|y\ is\ a\ real\ \#\}$

d) not a function

e) none of these

Solve the system of equations.

41.) $\begin{cases} x + 3y = 6 \\ 9y = -3x + 18 \end{cases}$

a) (2, 2) b) $\emptyset$ c) $\{(x, y)|x + 3y = 6\}$ d) $\left(\frac{1}{6}, \frac{2}{3}\right)$ e) none of these

Find the domain of the function.

42.) $f(x) = \frac{1}{6x+4}$

a) $\left\{x\middle|x \neq 0, \frac{2}{3}\right\}$ b) $\left\{x\middle|x \neq -\frac{2}{3}\right\}$ c) $\left\{x\middle|x \neq \frac{2}{3}\right\}$ d) $\left\{x\middle|x \neq -\frac{2}{3}, 0\right\}$ e) none of these

Find the slope and the y-intercept.

43.) $-3x - 4y = 6$

a) $m = -\frac{3}{4}$ $b = -\frac{3}{2}$ b) $m = -\frac{3}{2}$ $b = -\frac{3}{4}$ c) $m = \frac{4}{3}$ $b = 2$ d) $m = 2$ $b = \frac{4}{3}$

e) none of these

Solve the problem.

44.) The function $f(x) = -x^2 + 8x + 15$ represents the path of a ball thrown up in the air. Find the maximum height the ball will travel, in feet.

a) 4 ft b) 32 ft c) 15 ft d) 63 ft e) none of these

For the following function, indicate its vertex.

45.) $f(x) = -3x^2 - 12x - 7$

a) (5, -2) b) (-3, -7) c) (2, 42) d) (-2, 5) e) none of these

Solve the problem.

46.) The manufacturer of a cell phone has found that the revenue R (in dollars) is $R(p) = -p^2 + 230p$, when the unit prices is p dollars. If the manufacturer sets the price p to maximize revenue, what is the maximum revenue to the nearest whole dollar?

a) \$26,450 b) \$13,225 c) \$115 d) \$264,500 e) none of these

Use the quadratic formula to solve the equation.

47.) $2x^2 + 5x - 6 = 0$

a) $\left\{-\frac{5}{4} - \frac{\sqrt{73}}{4}, -\frac{5}{4} + \frac{\sqrt{73}}{4}\right\}$ b) $\left\{\frac{5}{4}, \frac{\sqrt{73}}{4}\right\}$ c) $\left\{\frac{\sqrt{73}}{4}, -\frac{5}{4}\right\}$ d) $\{5 - \sqrt{73}, 5 + \sqrt{73}\}$

e) none of these

Simplify if possible.

48.) $\dfrac{\frac{3}{x} + \frac{2}{y}}{\frac{6}{x} - \frac{7}{y}}$

a) $\frac{3y+2x}{6y-7x}$ b) $\frac{3x-2y}{6x-7y}$ c) $\frac{3y-2x}{6y+7x}$ d) $\frac{3(x+y)}{7(x-y)}$ e) none of these

Perform the operation. Simplify if possible.

49.) $\frac{2z^2-8}{6z^2-5z-6} \cdot \frac{3z^2+7z-6}{2z^2+2z-12}$

a) $\frac{z-2}{2z+3}$ b) $z + 2$ c) $\frac{3z-2}{2z-3}$ d) $\frac{(z+2)(3z-2)}{(2z-3)(3z+2)}$ e) none of these

Simplify the expression. Assume that variables in the exponent represents integers and all other variables are not 0.

50.) $\left(b^{(5x-2)}\right)^2$

a) b^{10x-2} b) b^{25x^2-4} c) b^{10x-4} d) b^{25x^2+4} e) none of these

Find the LCD of the following rational expressions.

51.) $\frac{4x-5}{2x^2-7x+3}$, $\frac{2x+3}{2x^2+7x-4}$

a) $(x-3)(x+4)$ b) $(x+4)^2$ c) $(2x-1)(x+4)$ d) $(x-3)(x+4)(2x-1)$ e) none of these

Perform the following operation. Simplify if possible.

52.) Find the difference of $\frac{4x+6}{2x^2+x-3}$ and $\frac{x-1}{x^2-1}$

a) $\frac{x-3}{x+1}$ b) $\frac{x+3}{(x+1)(x-1)}$ c) $\frac{x-3}{(x+1)(x-1)}$ d) $\frac{x+3}{x-1}$ e) none of these

Simplify.

53.) $\sqrt{162x^7y^{20}}$

a) $9x^3y^{10}\sqrt{2x}$ b) $9x^6y^6\sqrt{2xy^2}$ c) $81x^6y^{10}\sqrt{2x}$ d) $2x^3y^{10}\sqrt{81x}$ e) none of these

Solve using the quadratic formula.

54.) $p = -3p^2 + 3$

a) $\frac{-1 \pm \sqrt{37}}{5}$ b) $\frac{1 \pm \sqrt{37}}{6}$ c) $\frac{-1 \pm \sqrt{37}}{6}$ d) $\left\{-\frac{7}{6}, \frac{5}{6}\right\}$ e) none of these

Perform the indicated operations and simplify.

55.) $\sqrt{54x^3} + 3x\sqrt{16} - 2\sqrt{128}$

a) $3x\sqrt{9x} + 7x - 10\sqrt{2}$ b) $3x\sqrt{5x} + 12x - 2\sqrt{128}$ c) $3x\sqrt{6x} + 12x - 16\sqrt{2}$
d) $3x\sqrt{6x} + 7x - 16\sqrt{2}$ e) none of these

Solve the equation.

56.) $(x-1)^2 = 18$

a) $\{1 - 3\sqrt{2}, 1 + 3\sqrt{2}\}$ b) $\{1 - \sqrt{2}, 1 + \sqrt{2}\}$ c) $\{0\}$ d) $\{-3\sqrt{2}, 3\sqrt{2}\}$ e) none of these

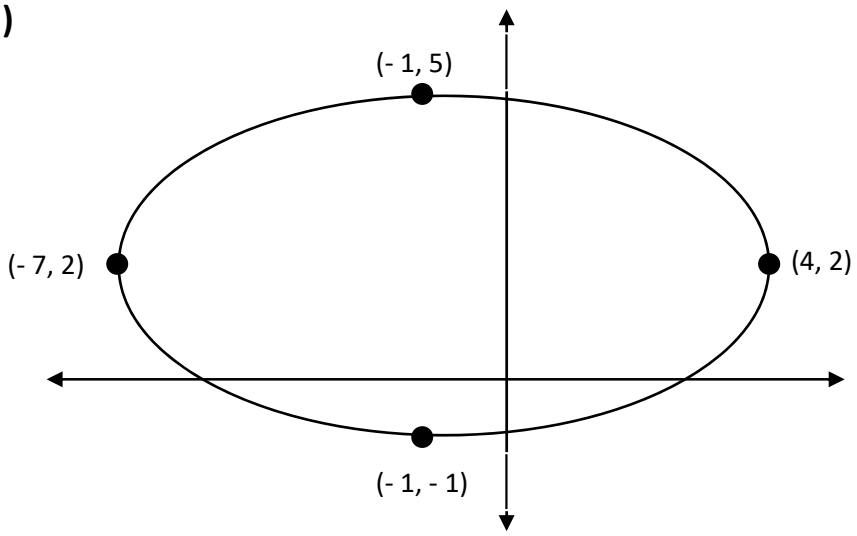
Multiply, and then simplify if possible.

57.) $\sqrt{5x}(6 + \sqrt{15x})$

a) $\sqrt{5x} + 5x\sqrt{3}$ b) $6 - 5\sqrt{3x}$ c) $6\sqrt{5x} + 5x\sqrt{3}$ d) $3 + 6\sqrt{5x}$ e) none of these

Identify the domain and the range of the relation from the graph.

58.)



a) domain: $[-7, -4]$ range: $[-1, -5]$
b) domain: $[-7, -4]$ range: $[-5, -1]$
c) domain: $[-4, -7]$ range: $[1, 5]$
d) domain: $[-7, 4]$ range: $[-1, 5]$
e) none of these

Solve.

59.) A clerk must use the elevator to move boxes of paper. The elevator's maximum weight limit is 1500 pounds. If each box of paper weighs 66 pounds and the clerk weighs 147 pounds, use an inequality to find the number of whole boxes she can move on the elevator at one time.

a) 21 boxes b) 19 boxes c) 22 boxes d) 20 boxes e) none of these

Write an equation of the line with the given information.

60.) Through the point (-2,6) and perpendicular to y = 7

a) y = 6 b) x = 6 c) x = -2 d) y = -2 e) none of these

Factor out the Greatest Common Factor.

61.) $-3x^3y + 2x^2y - 5xy$

a) $x(-3x^2y + 2xy - 5y)$ b) $-xy(3x^2 + 2x - 5)$ c) prime
d) $y(3x^2 + 2x^2 - 5x)$ e) none of these

Factor completely.

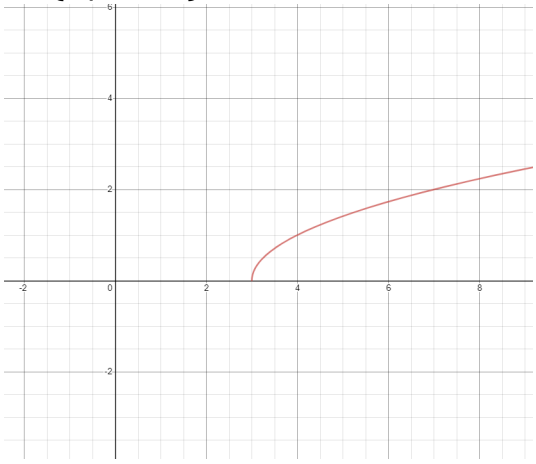
62.) $50 - 8y^2$

a) $2(25 - 4y^2)$ b) $(25 - 4y)(25 + 4y)$ c) $2(5 - 2y)^2$ d) $2(5 - 2y)(5 + 2y)$
e) none of these

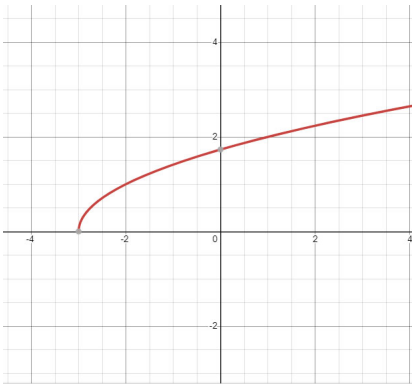
Identify the domain and graph the function.

63.) $f(x) = \sqrt{x-3}$

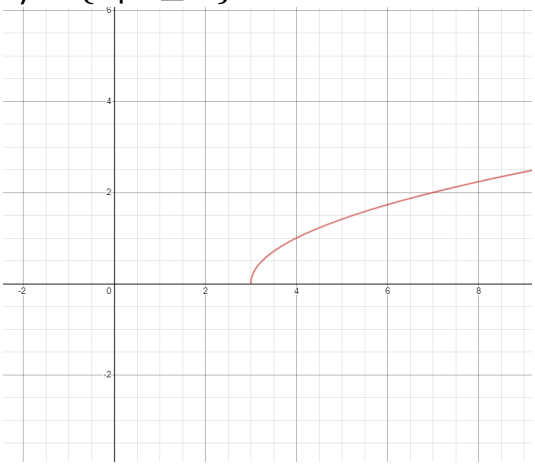
a) D: $\{x|x \neq 3\}$



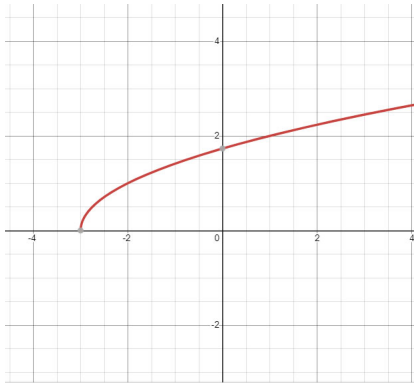
b) D: $\{x|x \leq 3\}$



c) D: $\{x|x \geq 3\}$



d) D: $\{x|x > 3\}$



e) none of these

Solve.

64.) Find the vertex of the graph of $f(x) = x^2 - 4x - 12$.

a) (2, -16) b) (-16, 2) c) (-2, 0) d) (0, -2) e) none of these

Solve. Round answers to the nearest tenth if necessary.

65.) C^{14}, a form of carbon that is used to find the age of fossils, has a half-life of 5730 years. How much of a 10-gram sample is left after 10,000 years? $y = C(1-r)^x$

a) 5.0 grams b) 4.0 grams c) 2.0 grams d) 3.0 grams e) none of these

Answer Key
Math 60 Review

1) c
2) c
3) c
4) d
5) c
6) b
7) a
8) d
9) b
10) c
11) a
12) d
13) c
14) d
15) c
16) a
17) b
18) a
19) c
20) a
21) b
22) a
23) d
24) b
25) c
26) c
27) c
28) a
29) c
30) d
31) d
32) c
33) c
34) b
35) a
36) c
37) c
38) c
39) d
40) b
41) c
42) b
43) a
44) e
45) d
46) b
47) a
48) a
49) d
50) c
51) d
52) b
53) a
54) c
55) c
56) a
57) c
58) d
59) d
60) c
61) b
62) d
63) c
64) a
65) d