Mr. Thurlwell's Supplemental Packet

Algebra 1

Unit 7: Function Analysis

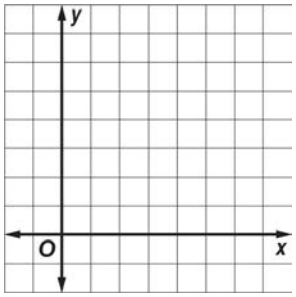
Name:_____

Assignment #1 (10.1) pg 624 14-40 even (no 34)	***=quiz to follow
Assignment #2 (10.3) pg 637 1-17	**EQ:** What operations can be used to solve rational expression functions?
Assignment #3 (10.3) pg 638 18-32	
Assignment #4 (10.4) pg 644 9-20	
Assignment #5 (10.4)*** pg 644 22-28,31,32	**EQ:** What operations can be used to solve radical functions?
Assignment #6 (11.2) pg 687 12-19,22-25	
Assignment #7 (11.2) pg 687 26-30,35,38-40,46	
Assignment #8 (11.8) pg 730 1-6	
Assignment #9 (11.8) pg 730 9-16	
Assignment #10 (11.8) pg 730 17-21,24	

10-1 Practice S*quare Root Functions*

Graph each function, and compare to the parent graph. State the domain and range.

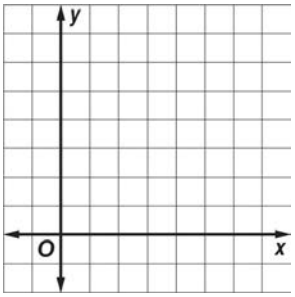
1 . $y = \frac{4}{3}\sqrt{x}$



D:

R:

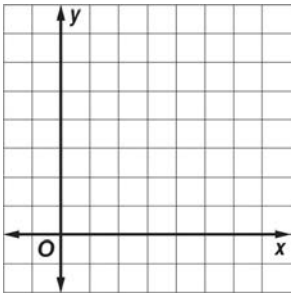
2. $y = \sqrt{x} + 2$



D:

R:

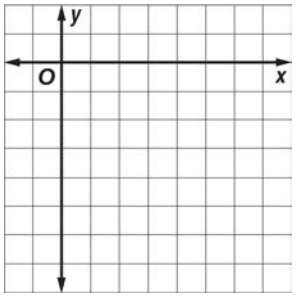
3. $y = \sqrt{x - 3}$



D:

R:

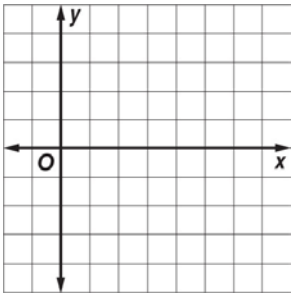
4. $y = -\sqrt{x} + 1$



D:

R:

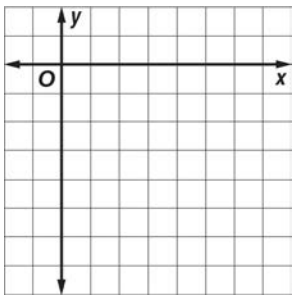
5. $y = 2\sqrt{x - 1} + 1$



D:

R:

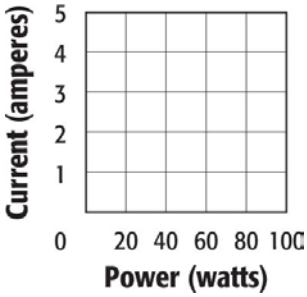
6. $y = -\sqrt{x - 2} + 2$



D:

R:

7. OHM'S LAW In electrical engineering, the resistance of a circuit can be found by the equation $I = \sqrt{\frac{P}{R}}$, where I is the current in amperes, P is the power in watts, and R is the resistance of the circuit in ohms. Graph this function for a circuit with a resistance of 4 ohms.



10.1 & 10.3 Practice

Simplify the expressions.

1) $3\sqrt{7}-5\sqrt{7}+4\sqrt{7}$

2) $8\sqrt{5}+\sqrt{125}$

3) $2\sqrt{2}+\sqrt{5}-6\sqrt{2}$

4) $4\sqrt{3}-\sqrt{27}$

5) $\sqrt{12}\cdot\sqrt{3}$

6) $\sqrt{3}\left(7+\sqrt{5}\right)$

7) $\left(1-\sqrt{3}\right)^2$

8) $\left(6-\sqrt{2}\right)\left(6+\sqrt{2}\right)$

9) $3\sqrt{2}+\sqrt{2}$

10) $\sqrt{20}+\sqrt{5}$

11) $\left(4-\sqrt{5}\right)^2$

12) $\sqrt{2}\cdot\sqrt{32}$

13) $2\sqrt{\frac{5}{81}}$

14) $\frac{14\sqrt{225}}{\sqrt{49}}$

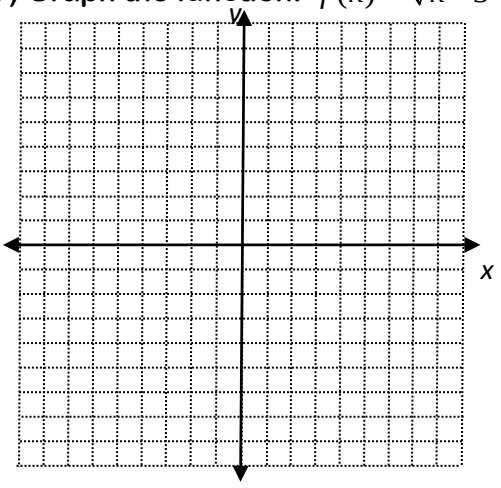
15) $\frac{1}{4}\sqrt{72}$

16) A pole–vaulter's approach velocity v (in feet per second) and height reached h (in feet) are related by the following equation.

Pole–vaulting model: $v=8\sqrt{h}$

Approximate how fast you were running if you vaulted 16 feet. How fast is that in m.p.h?

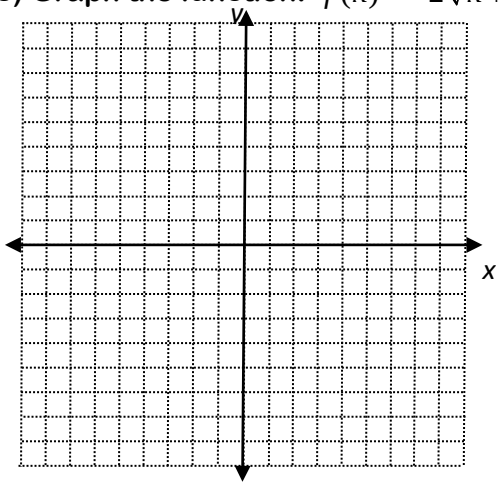
17) Graph the function: $f(x)=\sqrt{x-3}-5$



Domain:

Range:

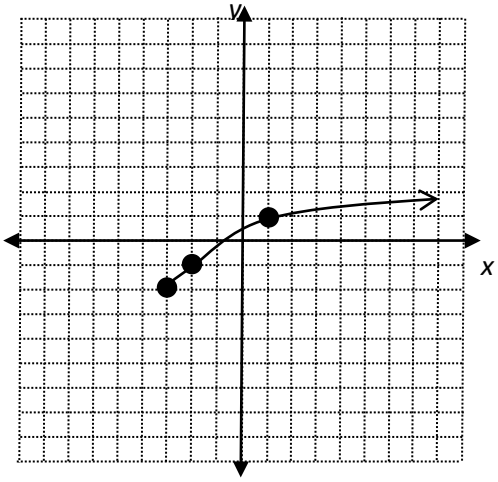
18) Graph the function: $f(x)=-2\sqrt{x+1}+1$



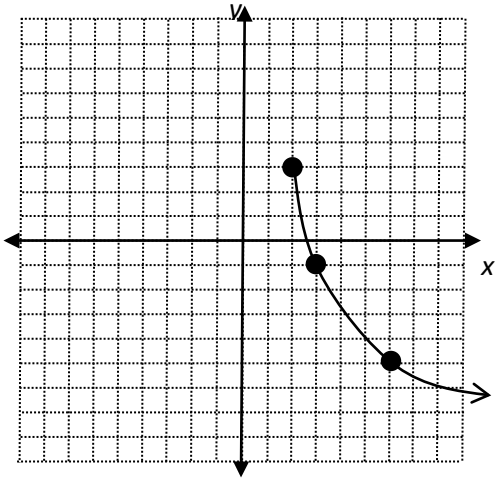
Domain:

Range:

19) Write the equation of the radical function.

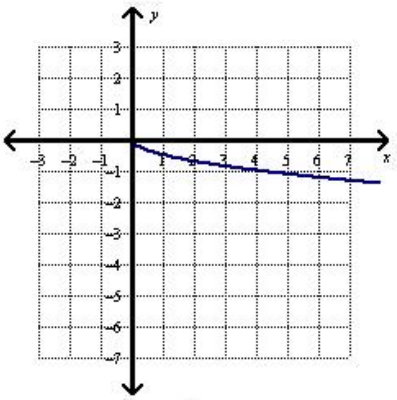


20) Write the equation of the radical function.

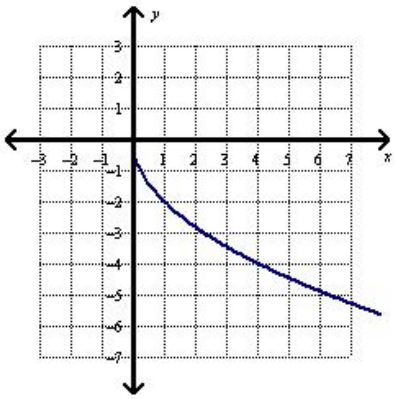


1. Choose the correct graph for the square root function $f(x) = -2\sqrt{x}$.

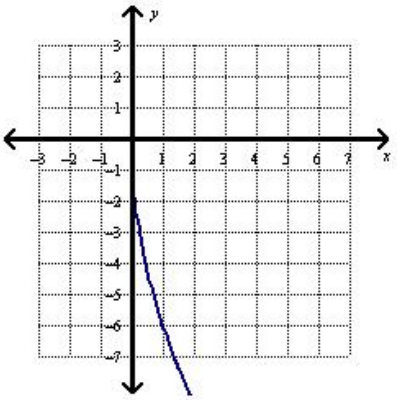
A.



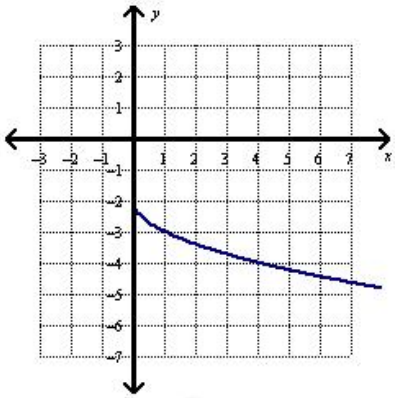
B.



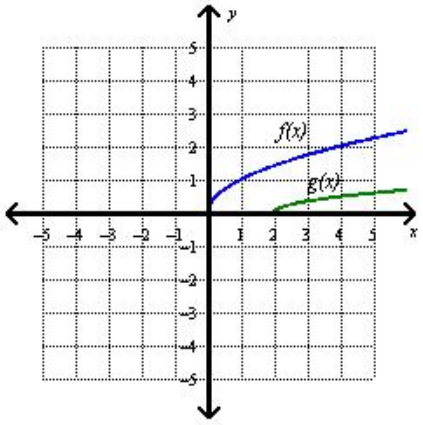
C.



D.



2. Describe how the graph of $g(x) = \frac{1}{3}\sqrt{x-2}$ is related to the graph of its parent function $f(x) = \sqrt{x}$.



A. The graph is stretched vertically and translated 2 units right.

B. The graph is stretched horizontally and translated 2 units right.

C. The graph is stretched horizontally and translated 2 units left.

D. The graph is stretched vertically and translated 2 units right, and reflected over the x-axis.

3. Simplify $(2+\sqrt{3})^2$

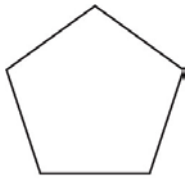
a) $7+4\sqrt{3}$ b) $7+7\sqrt{3}$ c) $7+2\sqrt{3}$ d) 7 e) $4+\sqrt{9}$

4. What is the domain and range of $g(x)$ in problem 2?

5. Simplify $3\sqrt{6} + 3\sqrt{2} - \sqrt{50} + \sqrt{24}$

6. Simplify $\sqrt{6}(3\sqrt{2} - 2\sqrt{3})$

7. The Pentagon is the building that houses the U.S. Department of Defense. Find the approximate perimeter of the building, which is a regular pentagon. Leave your answer as a radical expression.



10-4 Practice *Radical Equations*

Solve each equation. Be sure to check your solution(s).

1. $\sqrt{-b} = 8$

2. $4\sqrt{3} = \sqrt{x}$

3. $2\sqrt{4r} + 3 = 11$

4. $6 - \sqrt{2y} = -2$

5. $\sqrt{m - 5} = 4\sqrt{3}$

6. $\sqrt{5m - 16} = m - 2$

7. $\sqrt{6t + 12} = 8\sqrt{6}$

8. $\sqrt{3j - 11} + 2 = 9$

9. $6\sqrt{\frac{3x}{3}} - 3 = 0$

10. $6 + \sqrt{\frac{5r}{6}} = -2$

11. $\sqrt{10p + 61} - 7 = p$

12. $\sqrt{2x^2 - 9} = x$

13. Assuming no air resistance, the time t in seconds that it takes an object to fall h feet can be determined by the equation $t = \frac{\sqrt{h}}{4}$.

a. If a skydiver jumps from an airplane and free falls for 10 seconds before opening the parachute, how many feet does the skydiver fall?

b. Suppose a second skydiver jumps and free falls for 6 seconds. How many feet does the second skydiver fall?

10.4 Solving Radical Equations

Solve each radical equation.

1) $\sqrt{x}-16=0$

2) $\sqrt{4x+1}+5=10$

3) $x=\sqrt{-4x-4}$

RADICAL REVIEW!!! Simplify each radical expression.

4) $\sqrt{48}$

5) $5\sqrt{7}+9\sqrt{7}$

6) $\sqrt{24}-\sqrt{96}+\sqrt{6}$

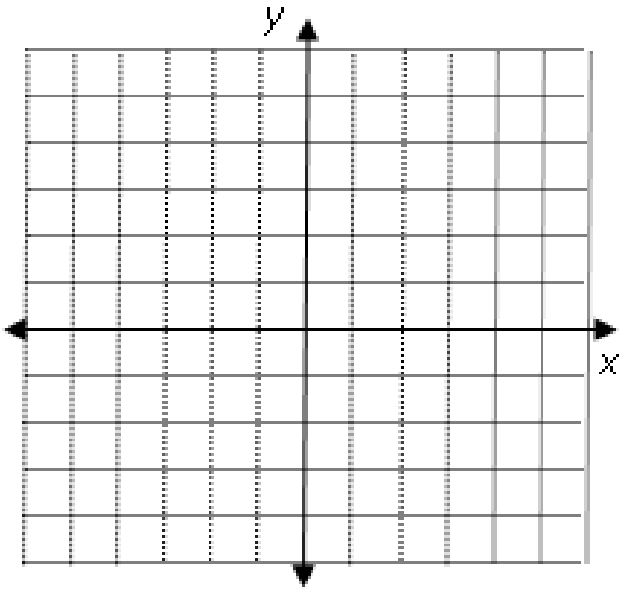
7) $\sqrt{5}\cdot\sqrt{8}$

8) A marketing department determines that the price of a *People* magazine subscription for one year and the demand to subscribe are related to the equation: $P=52-\sqrt{0.0002x+1}$, where P is the price per subscription and *x* is the number of subscriptions sold. If the yearly subscription price is set to \$30, how many subscriptions would be sold?

11.2 Example

Identify the asymptotes (horizontal and vertical) of each function. Then graph the function. State the domain and range:

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



11-2 Practice *Rational Functions*

State the asymptote (excluded value) for each function.

1. $y = \frac{-1}{x}$

2. $y = \frac{3}{x+5}$

3. $y = \frac{2x}{x-5}$

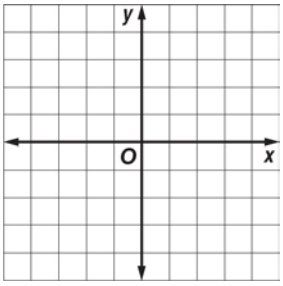
4. $y = \frac{x-1}{12x+36}$

5. $y = \frac{x+1}{2x+3}$

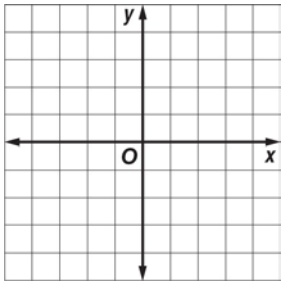
6. $y = \frac{1}{5x-2}$

Identify the asymptotes (horizontal and vertical) of each function. Then graph the function. State the domain and range:

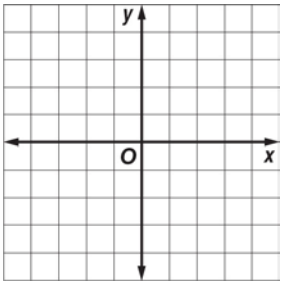
7. $y = \frac{1}{x}$



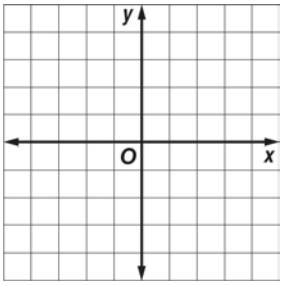
8. $y = \frac{3}{x}$



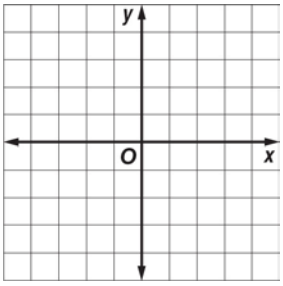
9. $y = \frac{2}{x-1}$



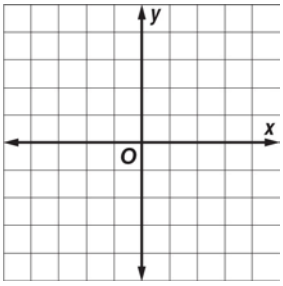
10. $y = \frac{2}{x+2}$



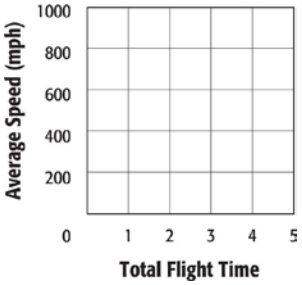
11. $y = \frac{1}{x-3} + 2$



12. $y = \frac{2}{x+1} - 1$



13. Chicago, IL is located approximately 1000 miles from Houston, TX. The average speed of a plane traveling between the two cities is given by $y = \frac{1000}{x}$, where x is the total flight time. Graph the function.



Algebra 1 Graphing Summary

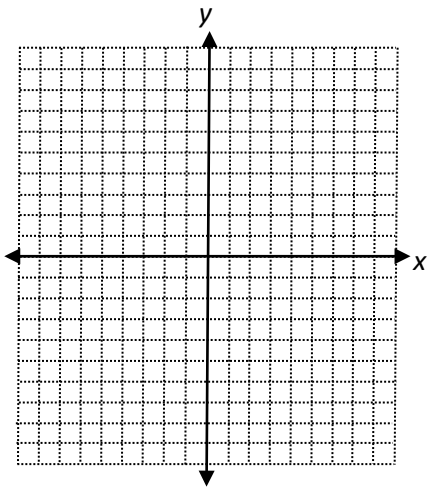
First, identify the type of function. Then, graph each function. State the domain and range.

1) $y = -\frac{1}{3}x + 5$

Type:_____

Domain:_____

Range:_____

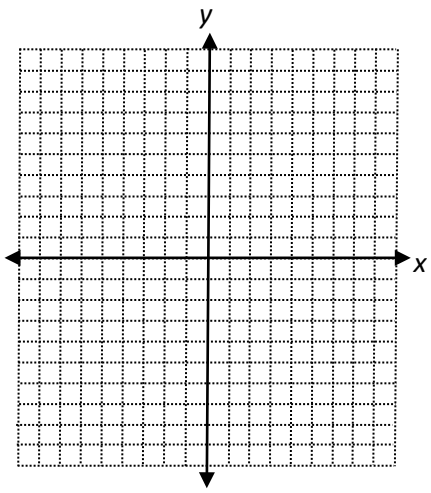


2) $g(x) = \frac{1}{2}(x+4)^2 - 1$

Type:_____

Domain:_____

Range:_____

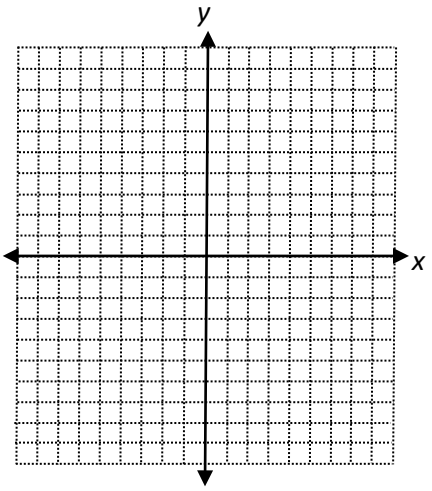


3) $y = 2\sqrt{x+3} + 5$

Type:_____

Domain:_____

Range:_____

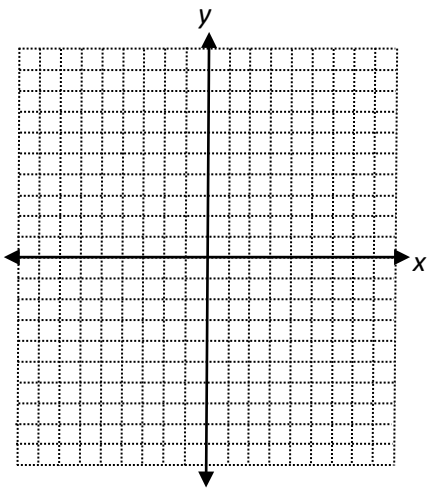


4) $h(x) = -\left(\frac{1}{2}\right)^x$

Type:_____

Domain:_____

Range:_____

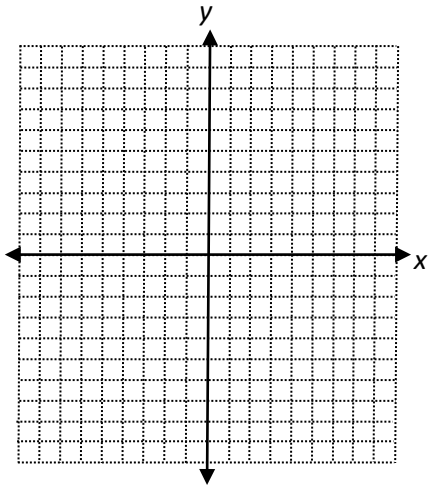


5) $-4x + 5y = 15$

Type:_____

Domain:_____

Range:_____

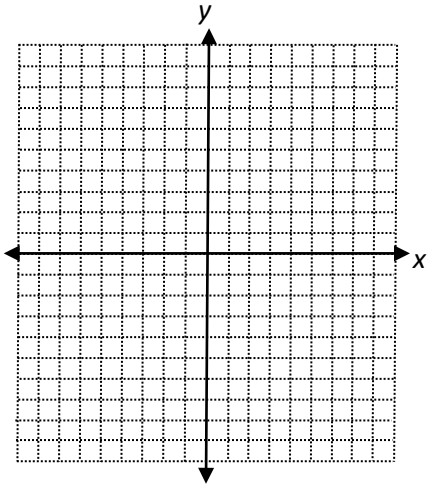


6) $y = x^2 - 7x + 10$

Type:_____

Domain:_____

Range:_____

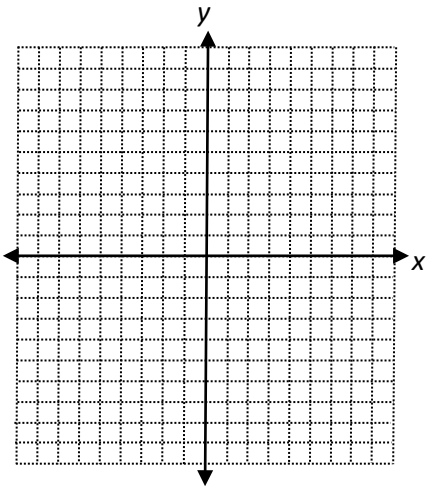


7) $f(x) = 2^x$

Type:_____

Domain:_____

Range:_____

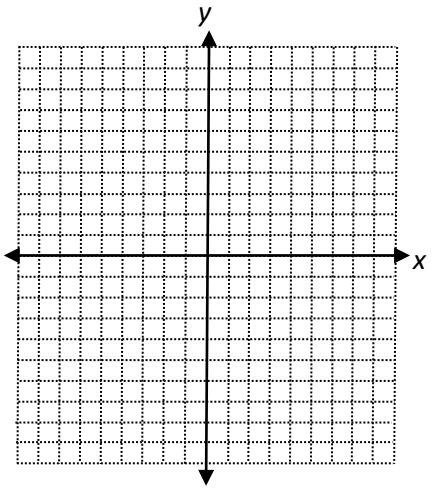


8) $y = \dfrac{2}{x-1}$

Type:_____

Domain:_____

Range:_____

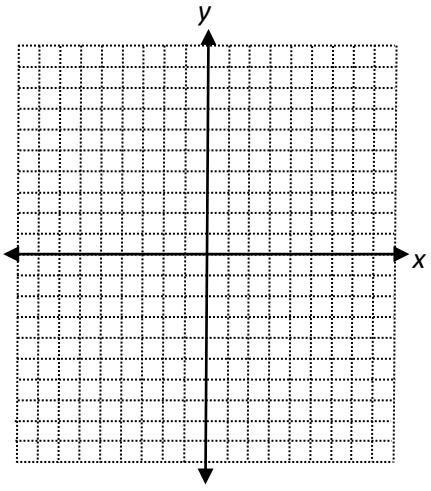


9) $w(x) = -\sqrt{x} - 2$

Type:_____

Domain:_____

Range:_____

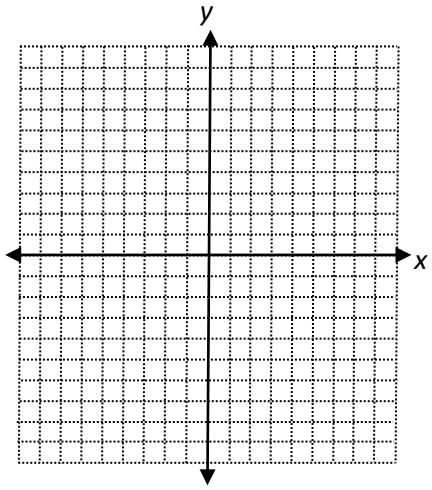


10) $p(x) = \frac{1}{x+3} - 4$

Type:_____

Domain:_____

Range:_____



11.8 Pre-Requisite skills

Solve each equation below. Be sure to check your solution.

LCD:

1) $\frac{1}{4}x+1=\frac{1}{6}x+\frac{1}{2}$

LCD:

2) $\frac{1}{5}y+\frac{9}{10}=\frac{3}{10}-\frac{y}{10}$

LCD:

3) $\frac{m-2}{3}+1=\frac{2m}{7}$

LCD:

4) $-3x-\frac{8}{9}=\frac{5}{6}$

LCD:

5) $\frac{2}{3}p-\frac{1}{2}=p+\frac{7}{6}$

LCD:

6) $\frac{k}{4}-\frac{2-k}{3}=\frac{1}{4}$

11.8 Rational Equations- Examples

1) Solve $\frac{3}{x+2} = \frac{5}{x+8}$

1) Do we need a LCD? If so, what is it?

What approach did we take?

2) Solve: $\frac{b-2}{b} = \frac{b+4}{b+2}$

2) Do we need a LCD? If so, what is it?

What approach did we take?

3) Slap it from video: $\frac{3}{2}x + \frac{2}{3} = \frac{7}{2}x + \frac{1}{6}$

3) Do we need a LCD? If so, what is it?

What approach did we take?

4) Solve: $\frac{2}{5x} = -\frac{3}{15} + \frac{1}{x}$

4) Do we need a LCD? If so, what is it?

What approach did we take?

5)Solve $\frac{2}{3}=\frac{7}{3(x-4)}-\frac{1}{x-4}$

5) Do we need a LCD? If so, what is it?

What approach did we take?

6) Solve $\frac{-4}{y-3}+1=-\frac{10}{y^2+y-12}$

6) Do we need a LCD? If so, what is it?

What approach did we take?

7) Solve $\frac{1}{x}+\frac{1}{x+1}=\frac{3}{2}$

7) Do we need a LCD? If so, what is it?

What approach did we take?

1) Solve the following linear equation: $\frac{2}{3}x+\frac{1}{5}=2x-\frac{3}{10}$

2) Find the least common denominator

a) $\frac{5}{9},\frac{6}{x},\frac{7}{2x}$ b) $\frac{2}{5},\frac{4}{x}$ c) $\frac{7}{5x+10},\frac{x}{x+2}$

Solve each equation

3) $\frac{x}{4}-\frac{5}{x}=\frac{1}{4}$ 4) $10-x=\frac{25}{x}$ 5) $\frac{2}{3}=\frac{7}{3x-12}-\frac{1}{x-4}$ 6) $\frac{x}{x+4}=\frac{4}{x+4}+2$

7) If the LCD of an equation was $12x^2$, give six possible denominators that could be in the equation.

8) ***Batting Averages*** You have had 28 hits in 112 times at bat. Your batting average is $\frac{28}{112}=0.250$. How many consecutive hits must you get to increase your batting average to 0.300?

9) ***Test Averages*** You have taken 3 tests and have an average of 70 points. If you score 90 points on the rest of your tests, how many more tests do you need to take to raise your average to 80?

For 1-5, simplify each expression.

1) $\sqrt{50}+\sqrt{32}-\sqrt{\frac{1}{2}}$

a) $4\sqrt{2}$ b) $\sqrt{2}-\frac{\sqrt{2}}{2}$ c) $\frac{17\sqrt{2}}{2}$ d) $17\sqrt{2}$

2) $\sqrt{6}\left(\sqrt{10}+\sqrt{15}\right)$

a) $5\sqrt{25}$ b) $5\sqrt{10}$ c) $3\sqrt{15}+2\sqrt{10}$ d) $2\sqrt{15}+3\sqrt{10}$

3) $\left(\sqrt{2}+2\sqrt{8}\right)\left(3\sqrt{6}-\sqrt{5}\right)$

a) $18\sqrt{3}-5\sqrt{10}$ b) $6\sqrt{3}-4\sqrt{10}$ c) $30\sqrt{3}-5\sqrt{10}$ d) $25\sqrt{3}-\sqrt{10}$

4) $\left(5-\sqrt{15}\right)^2$

a) 10 b) $15-10\sqrt{15}$ c) $40-10\sqrt{15}$ d) $10-10\sqrt{15}$

5) $5\sqrt{19}+4\sqrt{28}-8\sqrt{19}+\sqrt{63}$

a) $3\sqrt{19}+11\sqrt{7}$ b) $-3\sqrt{19}+11\sqrt{7}$ c) $8\sqrt{26}$ d) $13\sqrt{19}+11\sqrt{7}$

For 6-14, solve the equation.

6) $\sqrt{m-5} = 4\sqrt{3}$

a) 43 b) 53 c) 73 d) 17

7) $y = \sqrt{y+6}$

a) -2 b) Ø c)0 d) 3

8) $\sqrt{10p+61} - 7 = p$

a) -6 b) Ø c) $-\frac{59}{7}$ d) -6, 2

9) $\sqrt{2x+15} + 5 = 18$

a) 77 b) -16 c) -1 d) 28

10) $\frac{2h}{h-1} = \frac{2h+1}{h+2}$

a) $-\frac{1}{5}$ b) -5 c) $-\frac{1}{5}$; extraneous: –2, 1 d) $\frac{1}{5}$

11) $\frac{2q-1}{6} - \frac{q}{3} = \frac{q+4}{18}$

a) -7 b) no solution c) 7 d) $\frac{7}{17}$

12) $\frac{5}{p-1} - \frac{3}{p+2} = 0$

a) $-\frac{13}{2}$; extraneous: –2 b) $\frac{13}{2}$ c) $\frac{7}{2}$ d) $-\frac{13}{2}$

13) $\frac{n+2}{n} + \frac{n+5}{n+3} = -\frac{1}{n}$

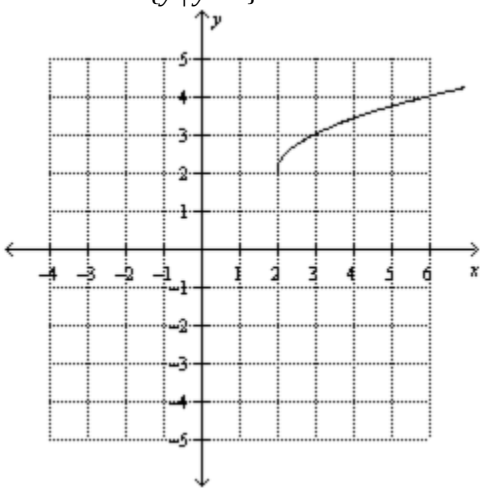
a) $-\frac{9}{2}$; extraneous: –1 b) –1; extraneous: –3 c) $-\frac{9}{2}$, –1 d) –9, –2

14) $\frac{2p}{p-2} + \frac{p+2}{p^2-4} = 1$

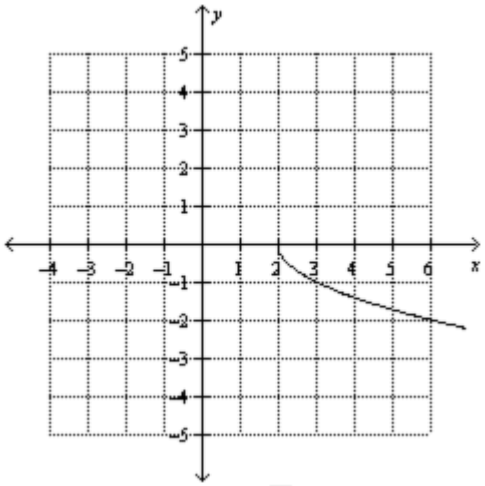
a) $-\frac{1}{3}$ b) $-\frac{1}{3}$; extraneous: –2 c) –3, –2 d) –3; extraneous: –2

15) Which statement below describes and shows the graph of $y = -\sqrt{x-2} + 2$

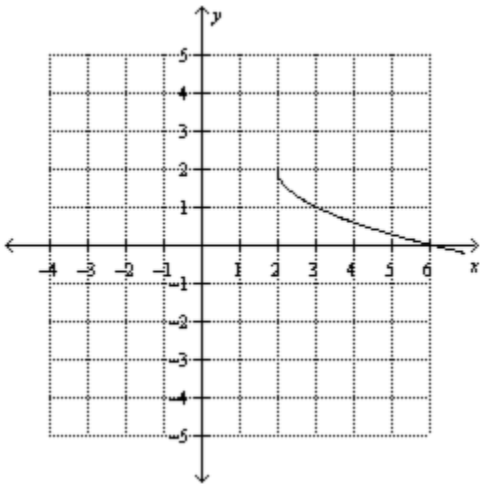
a) translation of $y = \sqrt{x}$ up 2 units and right 2 units;
D = $\{x \mid x \geq 2\}$,
R = $\{y \mid y \leq 2\}$



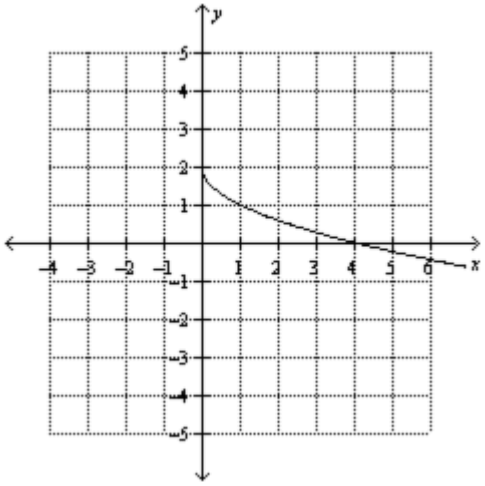
b) translation of $y = \sqrt{x}$ right 2 units, reflected in the *x*-axis;
D = $\{x \mid x \geq 2\}$,
R = $\{y \mid y \leq 2\}$



c) translation of $y = \sqrt{x}$ up 2 units and right 2 units, reflected in the *x*-axis;
D = $\{x \mid x \geq 2\}$,
R = $\{y \mid y \leq 2\}$

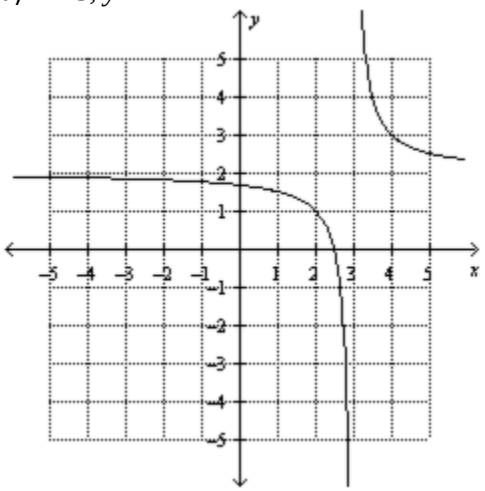


d) translation of $y = \sqrt{x}$ up 2 units reflected in the *x*-axis;
D = $\{x \mid x \geq 2\}$,
R = $\{y \mid y \leq 2\}$

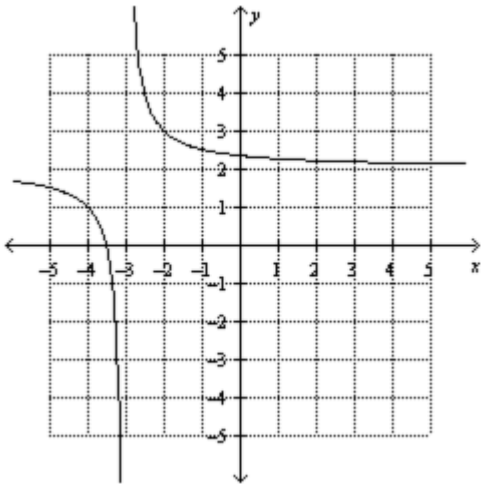


16) What are the asymptotes of the function : $y = \frac{1}{x-3} + 2$

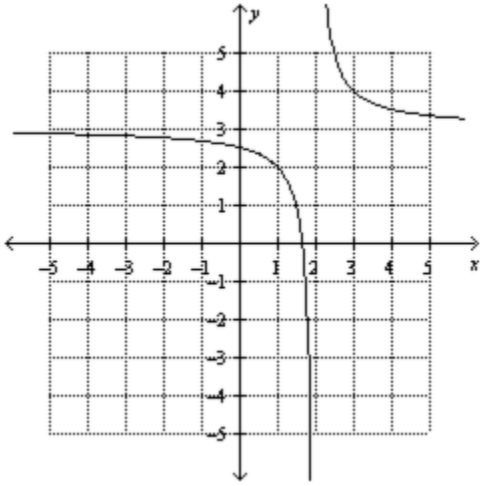
a) $x = 3$, $y = 2$



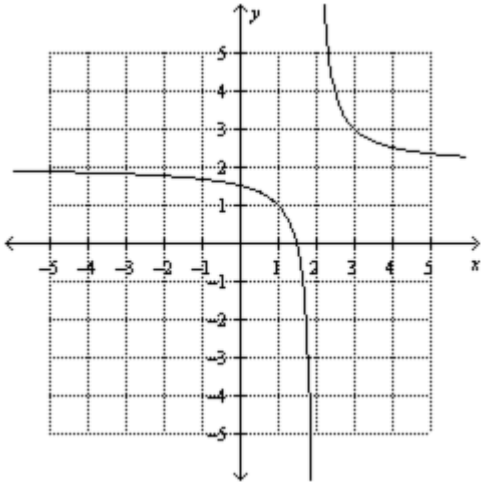
b) $x = -3$, $y = 2$



c) $x = 2$, $y = 3$

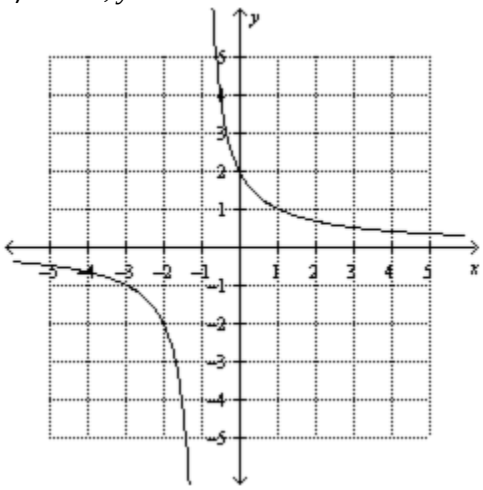


d) $x = 2$, $y = 2$

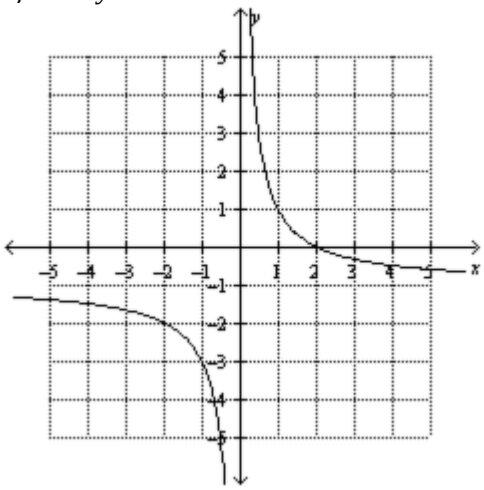


17) Graph $y = \frac{2}{x-1}$ and identify the asymptotes.

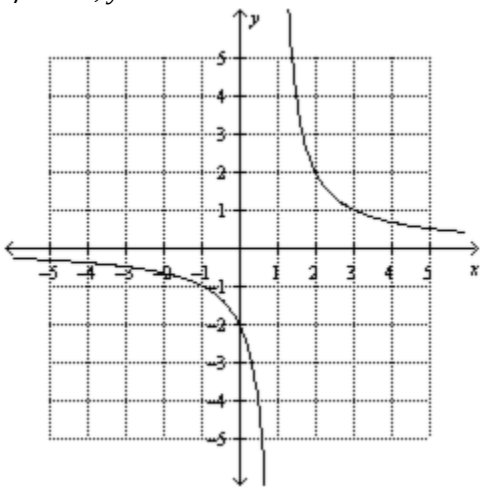
a) $x = -1, y = 0$



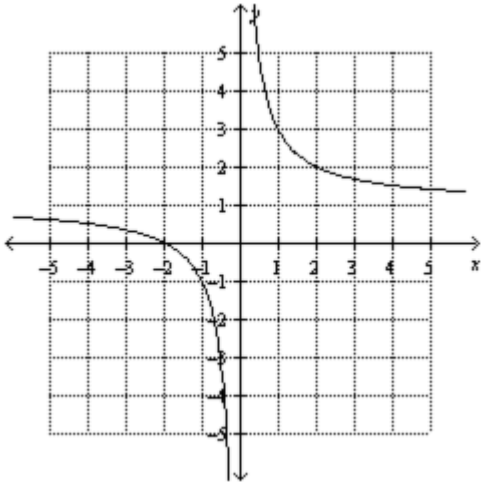
b) $x = 0\ y = -1$



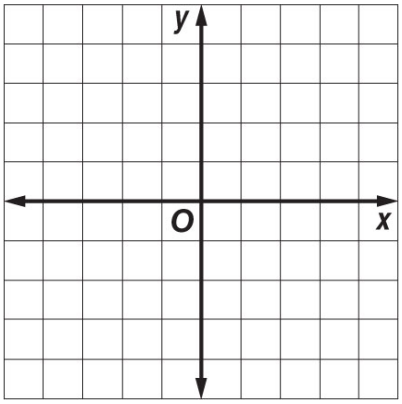
c) $x = 1, y = 0$



d) $= 0, y = 1$



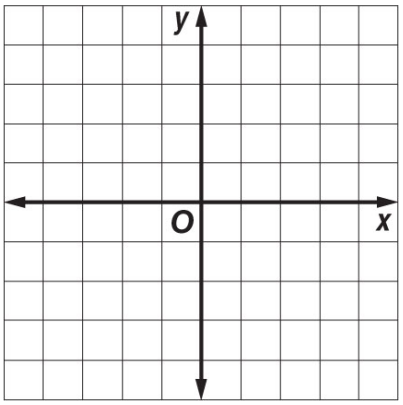
18) Graph $g(x) = -2\sqrt{x+3}+1$



Domain: _____

Range:_____

19) Graph $g(x) = \frac{3}{x+2} - 1$



x	y

Vertical Asymptote:_____

Horizontal Asymptote: _____

Domain: _____

Range: _____

Unit 7 Review #2

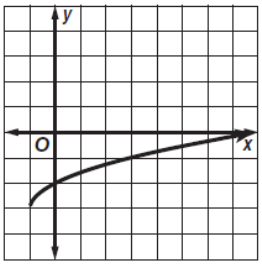
1. How does the graph of $y = \sqrt{x + 3}$ compare to the parent graph?

A) translated up 3
B) translated down 3
C) translated right 3
D) translated left 3

2. Which expression has a domain of $\{x \geq 2\}$?

A) $y = \sqrt{x} + 2$ B) $y = \sqrt{x} - 2$ C) $y = \sqrt{x + 2}$ D) $y = \sqrt{x - 2}$

3. What is the equation of the graph?



A) $y = \sqrt{x+1} - 3$ C) $y = \sqrt{x-1} + 3$

B) $y = \sqrt{x-1} - 3$ D) $\sqrt{x+1} + 3$

For questions 4 – 8, simplify each expression.

4. $8\sqrt{2} - \sqrt{2}$

A) 8 B) 16 C) $7\sqrt{2}$ D) $-8\sqrt{2}$

5. $\sqrt{18} - \sqrt{54} + 2\sqrt{50}$

A) $13\sqrt{2} - 3\sqrt{6}$ B) $-4\sqrt{3} + 4\sqrt{5}$ C) $-4\sqrt{3} - 4\sqrt{5}$ D) $8\sqrt{2} - 3\sqrt{6}$

6. $\sqrt{3}(5\sqrt{3} - \sqrt{6})$

A) $5\sqrt{9} - \sqrt{18}$ B) $15 - 3\sqrt{2}$ C) $8 - 3\sqrt{2}$ D) $15 - 2\sqrt{3}$

7. $(2 - 6\sqrt{7})^2$

A) $256 - 24\sqrt{7}$ B) 256 C) $1768 - 24\sqrt{7}$ D) $256 + 24\sqrt{7}$

8. $(\sqrt{5} + \sqrt{11})^2$

A) 16 B) 4 C) 146 D) $16 + 2\sqrt{55}$

9. Solve $\sqrt{3x-2}+4=8$.

A) 12 B) 6 C) $\frac{2}{3}$ D) $\frac{3}{2}$

10. Solve $\sqrt{7a+32}=a+2$.

A) –4 B) 7 C) –4, 7 D) –7, 4

11. Which is the solution of $\frac{x+1}{5}=\frac{2x}{15}$?

A) $-\frac{3}{5}$ B) $\frac{3}{5}$ C) -3 D) $-\frac{1}{5}$

12. Solve $\frac{5x}{3x+1}-\frac{10}{3x+1}=\frac{8}{5}$.

A) 58 B) $-\frac{18}{19}$ C) $\frac{18}{5}$ D) $-\frac{18}{5}$

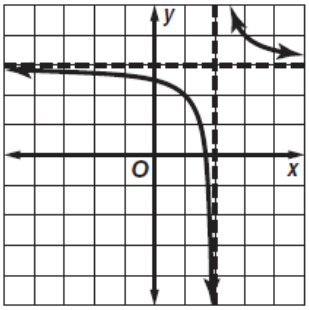
13. Which value is an extraneous solution of $\frac{x}{x+1}-\frac{6}{x^2-4x-5}=1$?

A) 5 B) 0 C) –1 D) 6

14. Given the rational equation $\frac{3}{2x+8}-\frac{1}{x+4}=\frac{5}{2}$, which polynomial would you multiply by to eliminate the denominators?

A) 2 B) $x+4$ C) $2x+4$ D) $2x+8$

15. Which function is graphed?



A) $y=\frac{1}{x+2}+3$ C) $y=\frac{1}{x-2}-3$

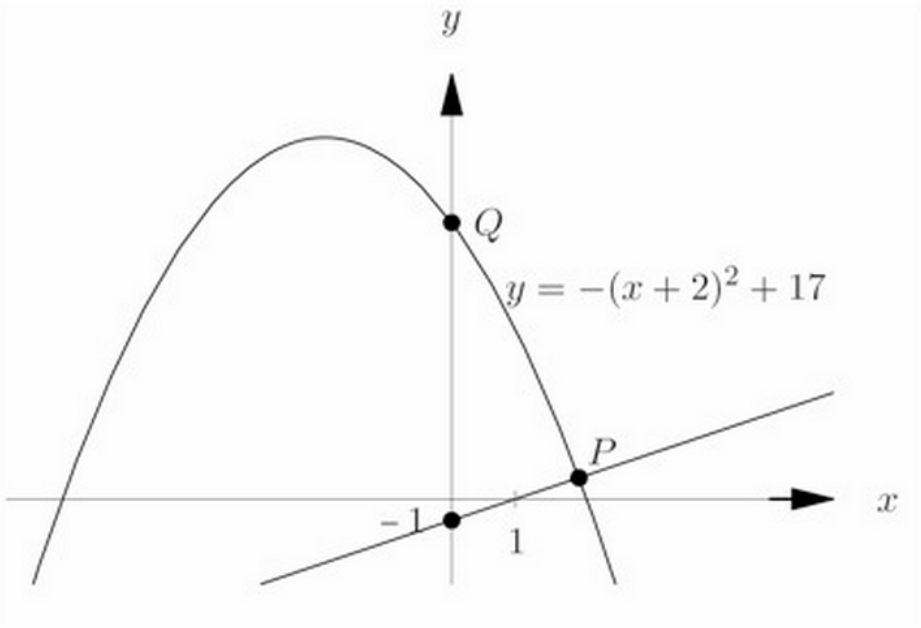
B) $y=\frac{1}{x+2}-3$ D) $y=\frac{1}{x-2}+3$

16. The velocity V of an object that has fallen d meters can be found using the equation $V=\sqrt{2gd}$, where g represents the gravitational constant and is equal to 9.81 m/s^2. Determine how fast a penny would be traveling when it hits the ground below after being dropped off the Willis Tower, which has a height of 520 meters.

A) 101 m/s B) 7214.2 m/s C) 10202.4 m/s D) 71.4 m/s

TASK 1

Consider the linear and quadratic functions appearing in the figure below.



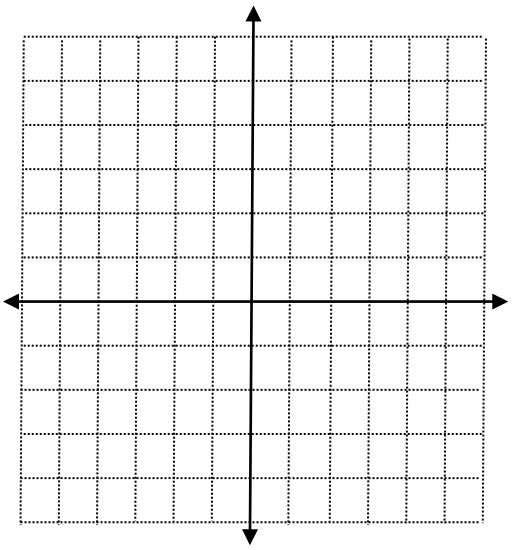
1) What are the coordinates of the point Q? Show step-by-step algebra work.

2) What are the coordinates of the point P? Show step-by-step algebra work.

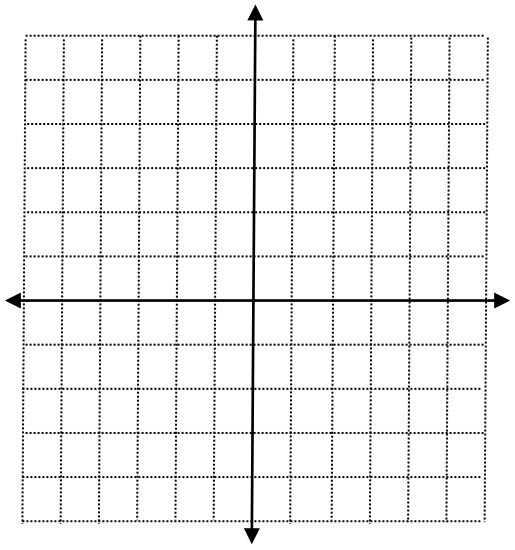
TASK 2

Solve the quadratic equation $x^2 = (2x - 9)^2$ using 4 different approaches. (NOTE; there realistically are 7 different approaches if not more!!! I have provided graphs on each approach but they don't necessarily need to be used if you do not wish.)

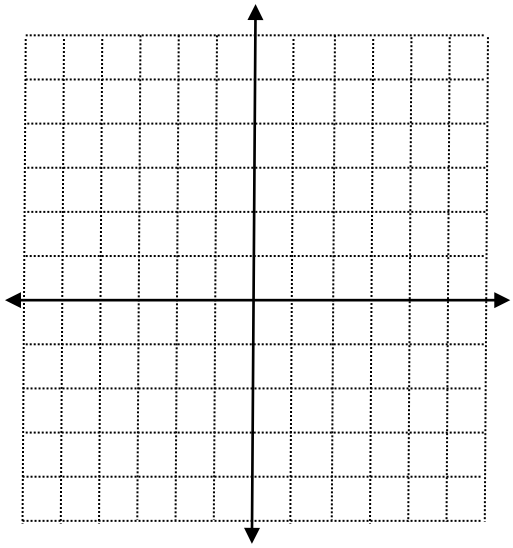
Approach 1



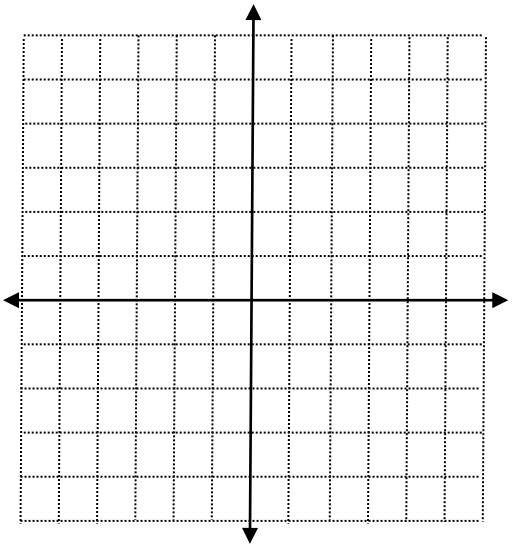
Approach 2



Approach 3



Approach 4



Cornell Notes Lecture, reading/chapter/novel/article during class, power point, movies (if need to collect info.) **Topic:**_____ _____	**Name:** _____ **Class:** _____ **Period:** _____ **Date:** _____
Essential Question:	
Questions/Main Ideas:	**Notes:**
Summary:	

Cornell Notes Lecture, reading/chapter/novel/article during class, power point, movies (if need to collect info.) **Topic:**_____ _____	**Name:** _____ **Class:** _____ **Period:** _____ **Date:** _____
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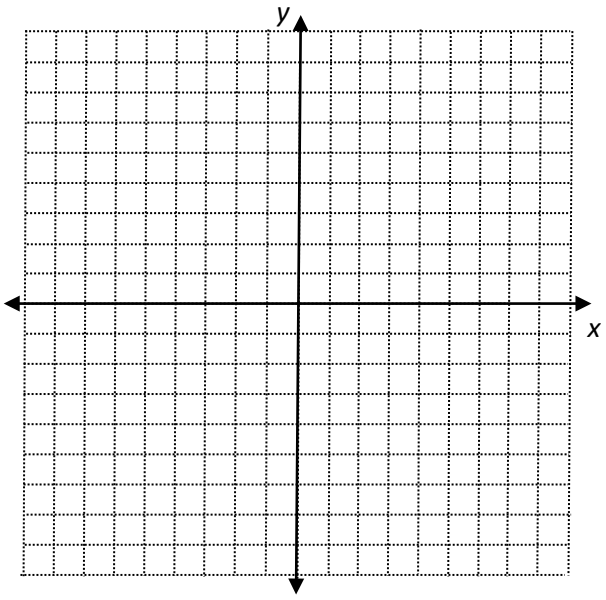
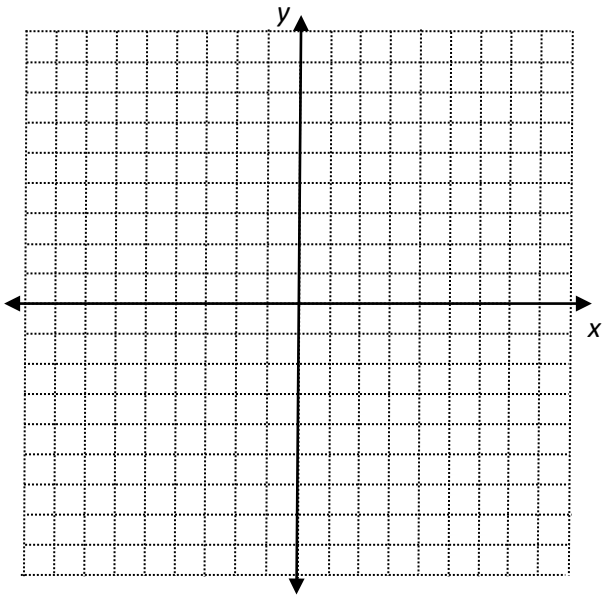
Essential Question:

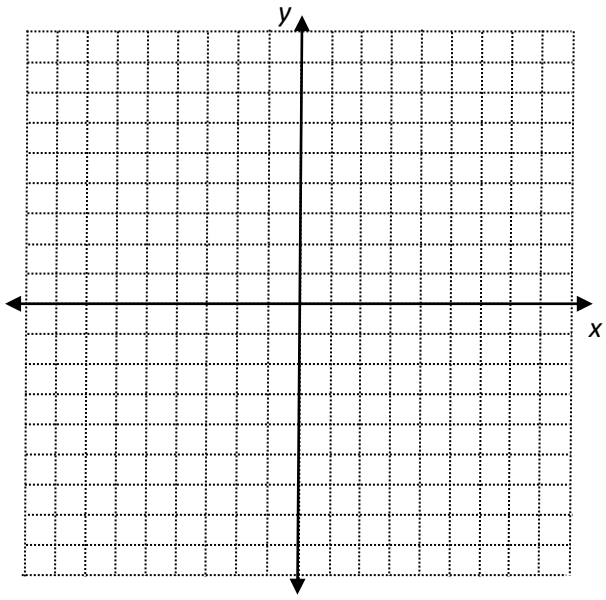
Questions/Main Ideas:	**Notes:**

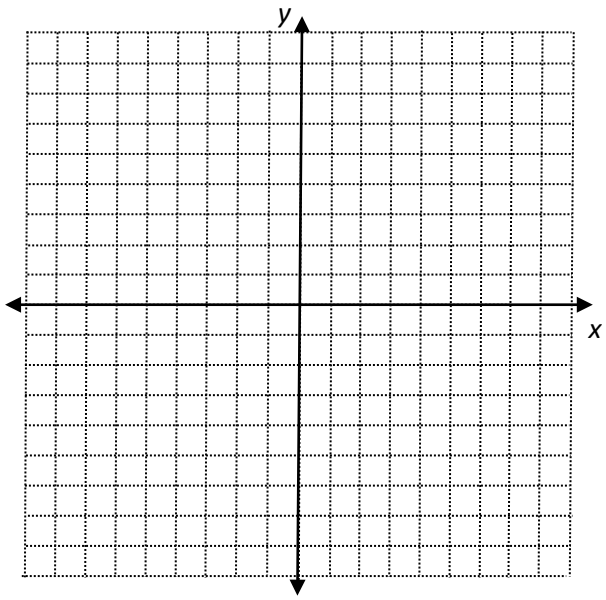
Summary:

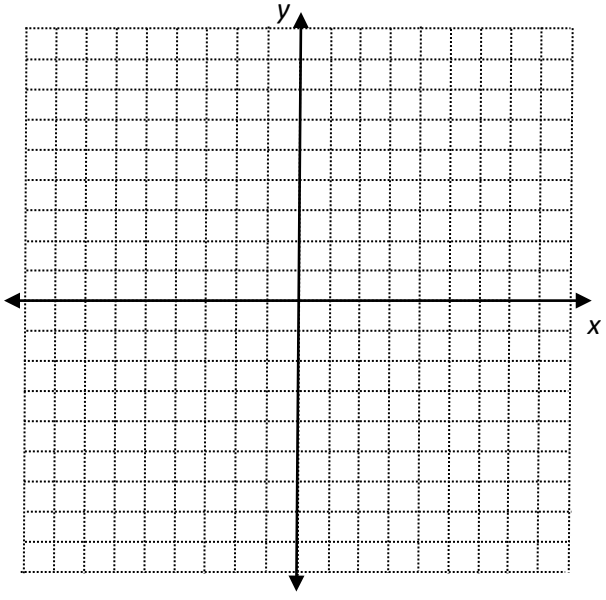
Extra Graphs

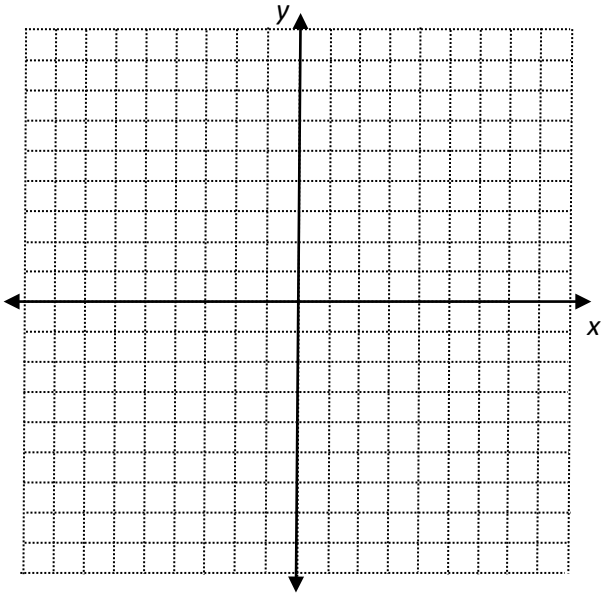












Add on problems or addition examples:

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