Name: _____ Area Problems

Do Now

1) Express the product of $2x^2 + 7x - 10$ and $x + 5$ in standard form.

Show your work.

Answer: _____

2) The formula for the area of a trapezoid is $A = \frac{1}{2}h(b_1 + b_2)$.

Part A

Express b_1 in terms of A, h, and b_2.

Show your work.

Answer: _____

Part B

The area of a trapezoid is 60 square feet, its height is 6 ft, and one base is 12 ft. Find the number of feet in the other base.

Show your work.

Answer: _____ ft

3) If $4x^2 - 100 = 0$, what are the roots of the equation?

A) -25, only
B) -5 and 5
C) -5, only
D) -25 and 25

4) How does the graph of $f(x) = 3(x - 2)^2 + 1$ compare to the graph of $g(x) = x^2$?

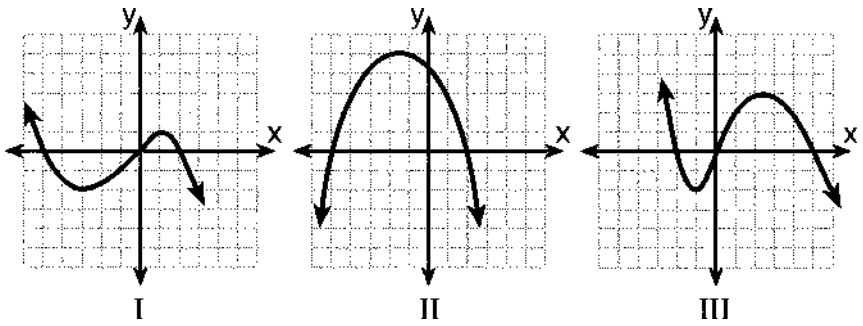
A) The graph of $f(x)$ is wider than the graph of $g(x)$, and its vertex is moved to the left 2 units and up 1 unit.

B) The graph of $f(x)$ is narrower than the graph of $g(x)$, and its vertex is moved to the left 2 units and up 1 unit.

C) The graph of $f(x)$ is narrower than the graph of $g(x)$, and its vertex is moved to the right 2 units and up 1 unit.

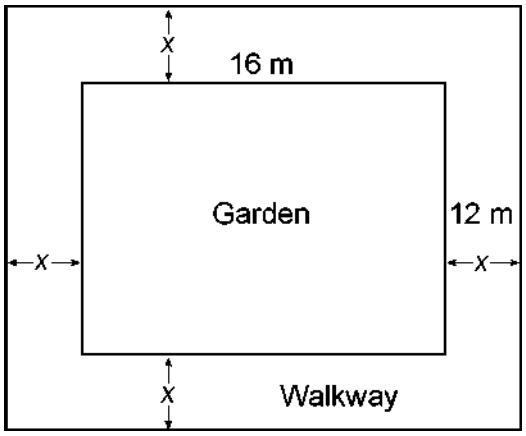
D) The graph of $f(x)$ is wider than the graph of $g(x)$, and its vertex is moved to the right 2 units and up 1 unit.

5) A polynomial function contains the factors x, $x - 2$, and $x + 5$. Which graph(s) below could represent the graph of this function?



A) *I*, *II*, and *III* B) *I*, only C) *II*, only D) *I* and *III*

6) A rectangular garden measuring 12 meters by 16 meters is to have a walkway installed around it with a width of x meters, as shown in the diagram below. Together, the walkway and the garden have an area of 396 square meters.



Part A

Write an equation that can be used to find x, the width of the walkway.

Answer: _____

Part B

Describe how your equation from *Part A* models the situation.

_____

_____

Part C

Using your answer from *Part A*, determine and state the width of the walkway, in meters. ***Show your work.***

_____

_____

7) New Clarendon Park is undergoing renovations to its gardens. One garden that was originally a square is being adjusted so that one side is doubled in length, while the other side is decreased by three meters.

Part A

The new rectangular garden will have an area that is 25% more than the original square garden. Write an equation that could be used to determine the length of a side of the original square garden.

Equation: _____

Part B

Explain how your equation models the situation.

_____

_____

_____

Part C

Determine the area, in square meters, of the new rectangular garden. ***Show your work.***

Answer: _____ m^2

8) A school is building a rectangular soccer field that has an area of 6,000 square yards. The soccer field must be 40 yards longer than its width. Determine algebraically the dimensions of the soccer field, in yards.

Show your work.

Answer: _____ yds

9) The volume of a large can of tuna fish can be calculated using the formula $V = \pi r^2 h$.

Part A

Write an equation to find the radius, r, in terms of V and h.

Show your work.

Equation: _____

Part B

Determine the diameter, to the nearest inch, of a large can of tuna fish that has a volume of 66 cubic inches and a height of 3.3 inches.

Show your work.

Answer: _____ in.

Name: _____ Date: _____

Homework 9-6: Area Problems.

10) The distance a free falling object has traveled can be modeled by the equation $d = \frac{1}{2}at^2$, where a is acceleration due to gravity and t is the amount of time the object has fallen. What is t in terms of a and d?

A) $t = \left(\frac{2d}{a}\right)^2$

B) $t = \left(\frac{da}{d}\right)^2$

C) $t = \sqrt{\frac{da}{2}}$

D) $t = \sqrt{\frac{2d}{a}}$

11) Fred is given a rectangular piece of paper. If the length of Fred's piece of paper is represented by $2x - 6$ and the width is represented by $3x - 5$, then the paper has a total area represented by

A) $6x^2 - 6x - 11$

B) $6x^2 - 28x + 30$

C) $10x - 22$

D) $5x - 11$

12) The equation for the volume of a cylinder is $V = \pi r^2 h$. The positive value of r, in terms of h and V, is

A) $r = \sqrt{V\pi h}$

B) $r = 2V\pi h$

C) $r = \frac{V}{2\pi}$

D) $r = \sqrt{\frac{V}{\pi h}}$

13) If the area of a rectangle is expressed as $x^4 - 9y^2$, then the product of the length and the width of the rectangle could be expressed as

A) $(x^2 - 3y)(x^2 + 3y)$

B) $(x - 3y)(x + 3y)$

C) $(x^2 - 3y)(x^2 - 3y)$

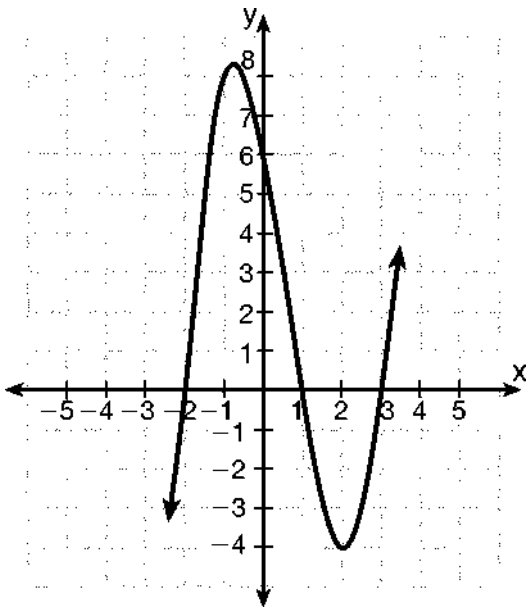
D) $(x^4 + y)(x - 9y)$

14) Which equation(s) represent the graph below?

I. $y = (x + 2)(x^2 - 4x - 12)$

II. $y = (x - 3)(x^2 + x - 2)$

III. $y = (x - 1)(x^2 - 5x - 6)$



A) *II*, only

B) *I*, only

C) *I* and *II*

D) *II* and *III*

15) Joey enlarged a 3-inch by 5-inch photograph on a copy machine. He enlarged it four times. The table below shows the area of the photograph after each enlargement.

Enlargement	0	1	2	3	4
Area (square inches)	15	18.8	23.4	29.3	36.6

What is the average rate of change of the area from the original photograph to the fourth enlargement, to the nearest tenth?

A) 4.3 B) 6.0 C) 5.4 D) 4.5

16) A landscaper is creating a rectangular flower bed such that the width is half of the length. The area of the flower bed is 34 square feet. Write and solve an equation to determine the width of the flower bed, to the nearest tenth of a foot.

Show your work.

Answer: _____ ft

17) A rectangular picture measures 6 inches by 8 inches. Simon wants to build a wooden frame for the picture so that the framed picture takes up a maximum area of 100 square inches on his wall. The pieces of wood that he uses to build the frame all have the same width.

Part A

Write an equation or inequality that could be used to determine the maximum width of the pieces of wood for the frame Simon could create. ***Show your work.***

Equation: _____

Part B

Explain how your equation or inequality models the situation.

_____

_____

_____

_____

Part C

Solve the equation or inequality to determine the maximum width of the pieces of wood used for the frame to the nearest tenth of an inch. ***Show your work.***

Answer: _____ in.