

Practice: Modeling with Functions (3A)

3A	I can <u>apply</u> the problem-solving algorithm: approach (know), set-up (given, want), procedure (analysis), and justification/reasoning to solve a variety of complex and novel problems and <u>explain</u> the purpose of the strategy.
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1. A rectangular building lot is three times as long as it is wide. Find a function that models its area A in terms of its width w .

Approach:

Set-Up:

Procedure:

2. A rectangular box has a square base. It's height is half the width of the base. Find a function that models its volume V in terms of its width w .

Approach:

Set-Up:

Procedure:

3. The height of a cylinder is four times its radius. Find a function that models the volume V in terms of its radius r .

Approach:

Set-Up:

Procedure:

4. A rectangle has an area of $16m^2$. Find a function that models its perimeter P in terms of the length l .

Approach:

Set-Up:

Procedure:

5. A poster is 10 inches longer than it is wide. Find a function that models its area A in terms of its width w .

6. Find a function that models the area A of an equilateral triangle in terms of the length x of one of its sides.

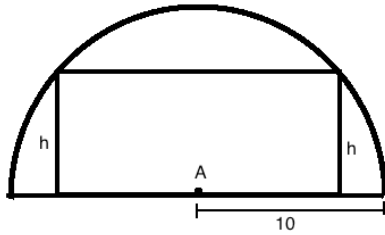
7. Find a function that models the surface area, SA , of a cube in terms of its volume V .

8. A woman that is 5 feet tall is standing near a street lamp that is 12 ft tall. Find a function that models the length, L , of her shadow in terms of her distance, d , from the base of the lamp.

9. Two ships leave port at the same time. One sails south at 15 mi/h and the other sails east at 20 mi/h. Find a function that models the distance, D , between the ships in terms of the time, t , (in hours) elapsed since their departure.

10. The sum of two positive numbers is 60. Find a function that models their product P in terms of x , one of the numbers.

11. A rectangle is inscribed in a semicircle of radius 10, as shown in the figure. Find a function that models the area A of the rectangle in terms of its height h .



12. Find two positive numbers whose sum is 100 and the sum of whose squares is a minimum.