

Starter #2

1. A rocket takes off from a 10 ft platform with an initial velocity of 135 ft/sec. How long is the rocket at least 100 ft in the air?
2. When will the rocket be 30 ft from the ground?
3. How high is the rocket 3 seconds after it is launched?

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$y_1 = -16t^2 + 135t + 10$
 $y_2 = 100$

The rocket exceeds 100 ft. between .73 and 7.71 sec after it is launched.

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Rational Inequality Quiz

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Homework Questions...

20, 20, 13, 13, 14, 9, 14, 12
 (9)

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6.6 Maximizing Word Problems

- Step 1: Write a two variable equation
- Step 2: Isolate y
- Step 3: Substitute y to write an equation in one variable
- Step 4: Graph to find the answer

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6.6 Modeling Using Perimeter and Area

Perimeter: $P = 2x + 2y$ Area: $A = xy$

x: John wants to put a fence all the way around both a dog park and a playground next to the dog park (as shown below). He wants the area of the playground and the dog park to be the same. John has 78 feet of fencing to work with and wants to use all of the fencing.

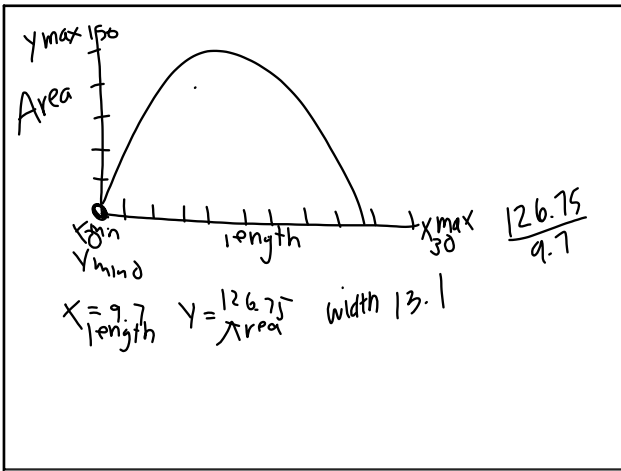
$y = -4x + 26$

a) Write an equation for the perimeter of the dog park and playground. Solve the equation for y. $4x + 3y = 78$ Step 1 $y = -\frac{4}{3}x + 26$ Step 2	b) Using your equation from part a, write a function for the area of the dog park in one variable. $A = x(-\frac{4}{3}x + 26)$
c) Graph the function from part b. (Be sure to label the axes and indicate the scale) 	d) What dimensions will maximize the area of the dog park? $L = 9.7$ ft $W = 13.1$ ft $A = 126.75$ ft ²

Find the maximum
 $x = 9.7$
 $y = 126.75$
 x-length
 y-area

$A = -\frac{4}{3}x^2 + 26x$
 width = $\frac{\text{area}}{\text{length}}$

Jan 25-6:03 AM



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$$4x + 3y = 78$$

$$\frac{3y}{3} = \frac{-4x + 78}{3}$$

$$y = -\frac{4}{3}x + 26$$

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Ex. The largest size envelope that can be mailed with a large envelope rate is 4 inches longer than it is wide. The area is 180 inches squared. Find the length and width.

length = $w + 4$ in
width = w 11.56 in

$A = L \cdot w$ $180 = w(w + 4)$

$180 = w^2 + 4w$ $y_1 = 180$
 $w^2 + 4w - 180 = 0$ $y_2 = x^2 + 4x$

$a = 1$ $b = 4$ $c = -180$

$w = 11.56$ in
 $L = 15.56$ in

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Ex. Find three consecutive integers such that the second number plus the product of the first and third numbers is a minimum.

1st # x . Square $(x+1)^2$
 2nd # $x+1$ $x(x+2)$
 3rd # $x+2$ $x^2 + 2x + 1 + x^2 + 2x$
 $2x^2 + 4x + 1$

$-1, 0, 1$

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#5 Triangular Tabletop $A = \frac{1}{2}bh$

$\frac{1}{2}h(h+20)$ $y_1 = 750$
 $\frac{1}{2}(h^2 + 20h)$ $y_2 = \frac{1}{2}h^2 + 10h$

$750 = \frac{1}{2}h^2 + 10h$

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$x = 30$ $y = 750$
 height

height 30 inches
 base 50 inches

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#6 Garden
 Old Area = 1200
 New Area = 600

The diagram shows a large rectangle with a smaller shaded rectangle inside. The outer rectangle has a top side labeled 40 and a right side labeled 30. The inner shaded rectangle has a top side labeled 40-2x and a right side labeled 30-2x. Dashed lines indicate the walkway of width x on all four sides.

Jan 6-12:29 PM

$$(40-2x)(30-2x) = 600$$

y_1 y_2

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$y_1 = (40-2x)(30-2x)$

$y_2 = 600$

The walkway
 is 5 ft.

$x = 5$
 ~~$x = 30$~~

The graph shows a coordinate plane with a parabola opening downwards. The x-axis has two points marked with asterisks, representing the solutions to the equation. The vertex of the parabola is below the x-axis.

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