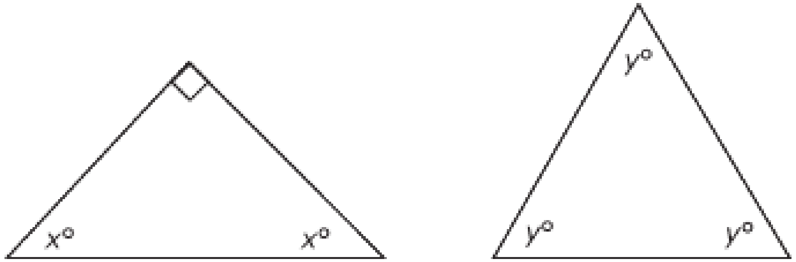
THURSDAY AUGUST 24, 2006

The Official SAT Question of the Day™

Read the following SAT test question, then click on a button to select your answer.



In the triangles above, $3(y - x) =$

A. 15

B. 30

C. 45

D. 60

E. 105

COMPLETE THE SQUARE EXAMPLE # 3

$f(x) = 3/5(x^2 + 4x - 2)$

$f(x) = \frac{3}{5}x^2 + \frac{12}{5}x - \frac{6}{5}$

$f(x) + \frac{6}{5} = \frac{3}{5}\left(x^2 + \frac{4}{1}x\right.$

$4 \cdot \frac{1}{2} \Rightarrow 2^2 \Rightarrow 4$

$f(x) + \frac{6}{5} + \frac{12}{5} = \frac{3}{5}(x^2 + 4x + 4)$

* I've really only added $\frac{3}{5} * 4$ to the Right side.

$f(x) + \frac{18}{5} = \frac{3}{5}(x+2)^2$

$f(x) = \frac{3}{5}(x+2)^2 - \frac{18}{5}$

① Move constant 1st

② Factor out a constant to get $+1x^2$

③ Multiply linear coefficient by $\frac{1}{2}$ → square it → add to both sides

V: $\left(-2, -\frac{18}{5}\right)$

axis: $x = -2$

up ~~down~~

FIND AN EQUATION FOR THE PARABOLA THAT HAS VERTEX (-3,2) AND GOES THROUGH THE POINT (0,3)

$$f(x) = a(x-h)^2 + k$$

1 step @ a time

Vertex 1st $f(x) = a(x+3)^2 + 2$

Step 2 use the point

$$3 = a(0+3)^2 + 2$$

$$3 = a(9) + 2$$

$$3 = 9a + 2$$

$$1 = 9a$$

$$\frac{1}{9} = a$$

$$f(x) = \frac{1}{9}(x+3)^2 + 2$$

Find the x-intercepts and compare them to the solutions of the quadratic equation.

f(x) = -2x^2 +10x

roots = x-intercepts = solutions

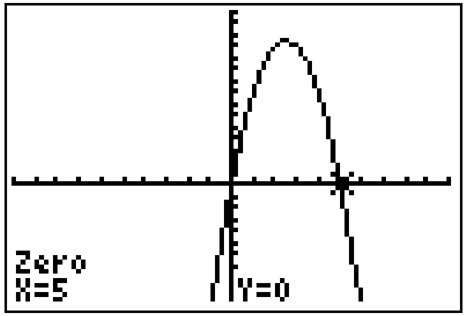
= zeroes

$-2x^2+10x=0$

$-2x(x-5)=0$

$-2x=0 \qquad x-5=0$

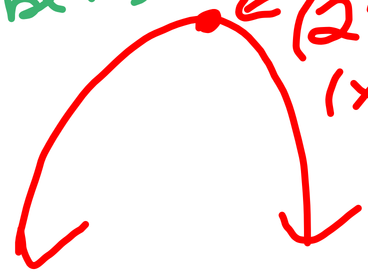
$x=0 \qquad x=5$



FIND TWO POSITIVE REAL NUMBERS WHOSE PRODUCT IS A MAXIMUM AND THE SUM IS 50.

1st # $x = 25$ 2 numbers

2nd # $50 - x = 25$



$f(x) = x(50 - x)$

$a = -1$

$b = 50$

$= 50x - x^2$

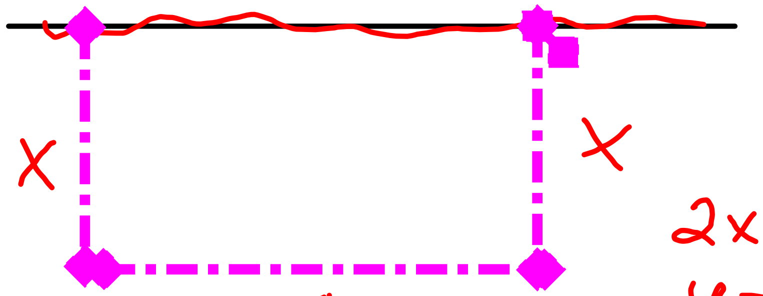
$= -x^2 + 50x$

$V_x = \frac{-b}{2a} = \frac{-50}{-2} = 25$

$V_y = 625$

Max/Min is the vertex → use the vertex formula

YOU ARE ENCLOSING A RECTANGULAR PEN NEXT TO YOUR NEIGHBOR'S FENCE AND HAVE 100 YARDS OF FENCING.
Maximize the area.



$y = -2x + 100$

$2x + y = 100$

$y = -2x + 100$

Area = length * width

$A = x \cdot y$

$= x(-2x + 100)$

$A(x) = -2x^2 + 100x$

you're finding a maximum → so find the vertex

$a = -2$

$b = 100$

$V_x = -\frac{b}{2a} = -\frac{100}{-4} = 25$

Dimensions: 25 yds x 50 yds

$y = -2x + 100$

$= -50 + 100 = 50$