Solving Quadratic Word Problems

The square of a positive number decreased by 4 times the number is 12. Find the positive number.

Let x be #

$x^2 - 4x = 12$

$x^2 - 4x - 12 = 0$

$(x - 6)(x + 2) = 0$

$x - 6 = 0$ | $x + 2 = 0$

$x = 6$ | $x = -2$

$x = 6$

The positive number will be 6

2. The area of a rectangle is 40. If the width is 6 less than the length, find the dimensions (length and width) of the rectangle.

$L = x$

40

$w = x - 6$

$A_{\square} = L \cdot w$

$40 = x(x - 6)$

$40 = x^2 - 6x$

$-40 \quad -40$

$0 = x^2 - 6x - 40$

$0 = (x + 4)(x - 10)$

$x + 4 = 0$ | $x - 10 = 0$

$x = -4$ | $x = 10$

Length = 10

Width = 4

3. The area of Bethany's rectangular yard is 54 square yards. If the length is 9 more than 3 times the width, find the dimensions (length and width) of the rectangle.

$L = 9 + 3w$

$54 yds^2$ $\quad w = w$

$A_{\square} = L \cdot W$

$54 = (9 + 3w)w$

$54 = 9w + 3w^2$

$-54 \qquad -54$

$0 = 9w + 3w^2 - 54$

$0 = 3w^2 + 9w - 54$

$0 = 3(w^2 + 3w - 18)$

1, 18
2, 9
3, 6

$0 = 3(w - 3)(x + 6)$

$3 \neq 0$ | $w - 3 = 0$ | $x + 6 = 0$

$w = 3$ | $x = -6$

Width: 3 yds

Length: 18 yds

4. Three brothers have ages that are consecutive even integers. The product of the first and third boys' ages is 20 more than twice the second boy's age. Find the age of *each* of the three boys.

Let x be 1st age

Let x+2 be 2nd age

Let x+4 be 3rd age

$x(x + 4) = 20 + 2(x + 2)$

$x^2 + 4x = 20 + 2x + 4$

$x^2 + 4x = 2x + 24$

$x^2 + 2x - 24 = 0$

$(x + 6)(x - 4) = 0$

$x + 6 = 0$ | $x - 4 = 0$

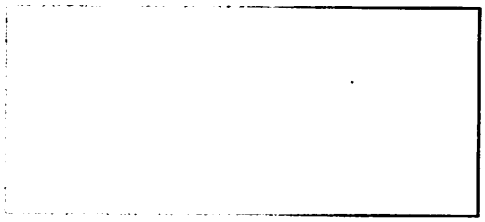
$x = -6$ | $x = 4$

Three boys ages are

4, 6, 8

Quadratic Word Problems Practice Name_____

1. Jack is building a rectangular dog pen that he wishes to enclose. The width of the dog pen is 2 yards less than the length. If the area of the dog pen is 15 square yards, find the dimensions of the pen.



2. Find three consecutive even integers such that the product of the first and the second is 3 times the third.