Quadratics Word Problems - Answers

Consecutive Integers

1. $x(x+1) = 1122$

$x^2 + x = 1122$

$x^2 + x - 1122 = 0$

$\frac{-1 \pm \sqrt{1^2 - 4(1)(-1122)}}{2(1)} =$

$\frac{-1 \pm \sqrt{1 + 4488}}{2} = \frac{-1 \pm \sqrt{4489}}{2} =$

$\frac{-1+67}{2}$ $\quad$ $\frac{-1-67}{2}$

33 $\quad$ (-34)

-34 and -33

Missing Lengths to find Area

1. $(x-5)(x+2) = 18$

$x^2 + 2x - 5x - 10 = 18$

$x^2 - 3x - 28 = 0$

$(x-7)(x+4) = 0$

$x - 7 = 0$ $\quad$ $x + 4 = 0$

$x = 7$ $\quad$ ~~$x = -4$~~

width $x - 5 = 7 - 5 = 2$

length $x + 2 = 7 + 2 = 9$

$w = 2 \quad l = 9$

2. $(x+1)(x-6) = 30$

$x^2 - 6x + x - 6 = 30$

$x^2 - 5x - 36 = 0$

$(x-9)(x+4) = 0$

$x - 9 = 0$ $\quad$ $x + 4 = 0$

$x = 9$ $\quad$ ~~$x = -4$~~

width $x + 1 = 9 + 1 = 10$

length $x - 6 = 9 - 6 = 3$

$w = 10 \quad l = 3$

3. $A = \frac{1}{2}bh$

2 $(225) = (\frac{1}{2}(7+h)(h))2$

$450 = (7+h)h$

$450 = 7h + h^2$

$0 = h^2 + 7h - 450$

$\frac{-7 \pm \sqrt{7^2 - 4(1)(-450)}}{2(1)} =$

$\frac{-7 \pm \sqrt{49 + 1800}}{2} =$

$\frac{-7 \pm \sqrt{1849}}{2} = \frac{-7 \pm 43}{2}$ → 18, −25

$h = 18$
$b = 25$

Increasing or Decreasing Lengths by "x"

1. $A = lw$

$285 = (12+2x)(16+2x)$

$285 = 192 + 24x + 32x + 4x^2$

$0 = 4x^2 + 56x - 93$

$\frac{-56 \pm \sqrt{56^2 - 4(4)(-93)}}{2(4)} =$

$\frac{-56 \pm \sqrt{3136 + 1488}}{8} =$

$\frac{-56 \pm \sqrt{4624}}{8} = \frac{-56 \pm 68}{8} =$

1.5, −15.5

The pathway has a width of 1.5 meters

2. $A = lw$

$546 = (18+x)(23+x)$

$546 = 414 + 18x + 23x + x^2$

$0 = x^2 + 41x - 132$

$\frac{-41 \pm \sqrt{41^2 - 4(1)(-132)}}{2(1)} =$

$\frac{-41 \pm \sqrt{1681 + 528}}{2} =$

$\frac{-41 \pm \sqrt{2209}}{2} = \frac{-41 \pm 47}{2}$ → 3, −44

$l = x + 18 = 21$
$w = x + 23 = 26$