Power of Quad. EQ WS

④ Let x = the #

$$x + \frac{1}{x} = \frac{10}{3}$$

↓ times $3x$

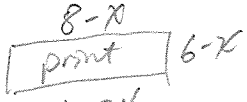
$$3x^2 + 3 = 10x$$

$$3x^2 - 10x + 3 = 0$$

$$(3x - 1)(x - 3) = 0$$

$x = \frac{1}{3}$ $\quad x = 3$ $\quad \left\{3, \frac{1}{3}\right\}$

⑦



$$(8-x)(6-x) = 24$$

$$48 - 14x + x^2 = 24$$

$$x^2 - 14x + 24 = 0$$

$$(x-12)(x-2) = 0$$

$x = 12$ $\quad x = 2$

OMIT

width = 6
length = 4

ck: $A = 4(6)$
$= 24$ ✓

① Let x = 1st cons #

$x + 1$ = 2nd " #

$$x^2 + (x+1)^2 = 265$$

$$x^2 + x^2 + 2x + 1 = 265$$

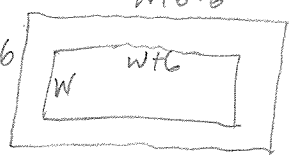
$$2x^2 + 2x - 264 = 0$$

$$2(x+12)(x-11) = 0$$

$x = -12$ $\quad x = 11$

$\{-12, -11\}$ $\quad \{11, 12\}$

② W+6+6



Let W = width of garden
W+6 = length of garden

$$(W+6)(W+12) - 288 = W(W+6)$$

$$W^2 + 18W + 72 - 288 = W^2 + 6W$$

$$12W - 216 = 0$$

$$12W = 216$$

$$W = 18$$

Garden: W = 18 ft $\quad$ A = 432 sq ft.
L = 24 ft.

walkway: W = 24
L = 30

A = 720

ck: 720 − 288 = 432 ✓

③ Let x = the #

$$x + x^2 = 72$$

$$x^2 + x - 72 = 0$$

$$(x+9)(x-8) = 0$$

$x = -9$, $x = 8$

$-9 + 81 = 72$
$72 = 72$ ✓

$8 + 64 = 72$
$72 = 72$

$\{-9, 8\}$

⑤

doubled area = 48

Let x = # meters increased

$4+x$ = new width

$6+x$ = new length

$48 = (x+4)(x+6)$

$48 = x^2+10x+24$

$0 = x^2+10x-24$

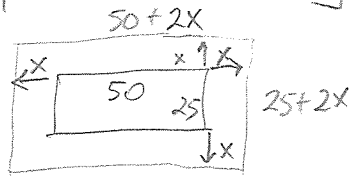
$0 = (x+12)(x-2)$

$x = -12$ $\quad x = 2$

extraneous

{Increase each dimension by 2 meters.}

⑥



Let x = # feet increased

$(50+2x)(25+2x) = 50(25)+400$

$1250+150x+4x^2 = 1650$

$4x^2+150x-400 = 0$

$(2x-5)(2x+80) = 0$

$x = \frac{5}{2}$ $\quad$ ~~$x = -40$~~ extraneous

{Each dimension is increased by 5 feet.}

⑦

← area = 48

Let x = amt reduce by

$6-x$ = new length

$8-x$ = new width

$(6-x)(8-x) = 24$

$48-14x+x^2 = 24$

$x^2-14x+24 = 0$

$(x-12)(x-2) = 0$

~~$x = 12$~~ $\quad x = 2$

omit extraneous

{dimensions are 4 cm & 6 cm}

⑧ Let x = the #

$x^2+21 = 10x$

$x^2-10x+21 = 0$

$(x-7)(x-3) = 0$

$x = 7$, $x = 3$

{7 & 3}

ck

$x = 7$

$49+21 \stackrel{?}{=} 10(7)$

$70 \stackrel{\checkmark}{=} 70$

$x = 3$

$9+21 = 3(10)$

$30 \stackrel{\checkmark}{=} 30$

⑨ Let x = #

$30-\frac{1}{2}x = \frac{1}{6}x^2$

$0 = \frac{1}{6}x^2+\frac{1}{2}x-30$

$0 = x^2+3x-180$

$0 = (x+15)(x-12)$

$x = -15$ $\quad x = 12$

{-15 and 12}

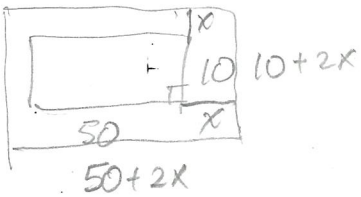
Name KEY

Advanced Algebra (H)

Solving problems with quadratic equations.

pay attention!

1. A cement walk of uniform width surrounds a rectangular swimming pool that is 10 m wide and 50 m long. Find the width of walk if its area is 864 m^2.



$W = 50+2x$

$L = 10+2x$

$A = W_W \cdot L_W - A_{pool}$

$864 = (50+2x)(10+2x) - 10(50)$

$= 500 + 120x + 4x^2 - 500$

$A(x) = 4x^2 + 120x - 864$

$= x^2 + 30x - 216$

$= (x + 36)(x - 6)$

$x = -36$ OMIT $\quad x = 6$

Width of walk

$W = 6$ m

ck

$A_{LG} = (50+2(6))(10+12)$

$= 1364$

$A_{pool} = 500$

865 sq m ✓

2. The sum of the number of A's and B's on a math test is 15. There are more B's than A's, and the sum of the squares of the two numbers is 113. find the number of A's and the number of B's.

Let A = # of A's.

$15 - A$ = # of B's

$A^2 + (15-A)^2 = 113$

$A^2 + 225 - 30A + A^2 = 113$

$2A^2 - 30A + 225 = 0$

$2A^2 - 30A + 112 = 0$

$A^2 - 15A + 56 = 0$

$(A-7)(A-8) = 0$

$A = 7 \quad A = 8$

$B = 8 \quad B = 7$ OMIT

There are 7 A's & 8 B's.

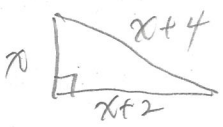
ck

$7 + 8 = 15$

$7^2 + 8^2 =$

$113 = 113$ ✓

3. The lengths of the three sides of a right triangle are consecutive even integers. Find the length of each side of the triangle.



$a^2 + 6^2 = c^2$

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

$x^2 + x^2 + 4x + 4 = x^2 + 8x + 16$

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

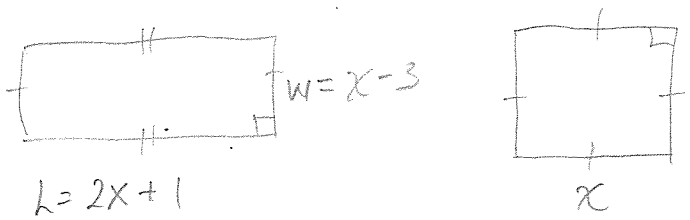
$(x-6)(x+2) = 0$

$x = 6 \quad x = -2$

OMIT

The 3 sides have lengths 6, 8, 10.

4. The length of a rectangular table is 1 foot more than twice the length of a side of a square rug and the width of the table is 3 feet less than the length of a side of the rug. If the area of the table is 81 ft^2 greater than the area of the rug, what is the area of the rug?



$A_{Table} = 81 + A_{rug}$

$(2x+1)(x-3) = 81 + x^2$

$2x^2 - 5x - 3 = 81 + x^2$

$x^2 - 5x - 84 = 0$

$(x-12)(x+7) = 0$

$x = 12 \quad x = -7$ OMIT

Side of rug = 12 feet

Area of rug = 144 sq. feet

ck

Table: $w = 9$

$L = 25$

$A = 225$

Rug: $A = 144$

$144 + 81 = 225$ ✓