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W S 4.1

MATHEMATICS

STANDARD: 10

SECOND DEGREE EQUATIONS

1 Fill in the blanks same as the given example

Eg:	$(x-5)^2 = 900$	$x-5 = \sqrt{900} = 30$	$x = 30+5 = 35$
(a)	$(x-10)^2 = 100$	$x-10 =$ —	$x =$ —
(b)	$(x+1)^2 = 225$	$x+1 =$ —	$x =$ —
(c)	$(x-1)^2 = 100$	$x-1 =$ —	$x =$ —
(d)	$(x-3)^2 = 121$	$x-3 =$ —	$x =$ —
(e)	$(x+7)^2 = 225$	$x+7 =$ —	$x =$ —

2 The product of a positive number and the number 8 more than it is 105

a) What is the least number to be added to make the product a perfect square? b) What are the numbers?

Numbers = x , —

$x(x + 8) =$ —

$x^2 +$ — $= 105$

$x^2 + 8x +$ — $= 105 + 4^2$

∴ The least number added to the given product to get a perfect square = —

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$(x + 4)^2 = 105 + —$

$(x + 4)^2 = —$

$x + 4 = \sqrt{121}$

$x + 4 = —$

$x = — + 11$

$x = —$

$x + 8 = —$

$\therefore$ Numbers = —, —

3 One side of a rectangle is 2m longer than the other side and its area is 224m² What are the length of the sides?

Length of the smaller side = x

Length of the longer side = —

$$\text{Area} = x \times —$$

$$x \times — = 224$$

$$x^2 + 2x = 224$$

$$x^2 + 2x + — = 224 + —$$

$$(x + —)^2 = (—)^2$$

$$x + — = —$$

$$x = —$$

Length of the sides = —,—

4 How many consecutive terms of the arithmetic sequence 5 , 7 , 9 … must be added to get 140 ?

First term = —

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Common difference = —

x_n = dn + f-d

= 2n + —

$S_n = \frac{n}{2}[x_1 + x_n]$

$\frac{n}{2}$ [5 + —] = 140

$\frac{n}{2}$ [2n + —] = 140

$\frac{n}{2}$ × 2 [n+ —] = 140

n (n + —) = 140

n^2 + n × — = 140

The number to be added to change it into a perfect square = —

n^2 + 4n + — = 140 + —

(n + —)² = —

n + — = —

n = — - —

= —

∴ The total number of consecutive terms added to get 140 = —

5 When each side of a square is increased by 2cm the area will become 100cm². What is the length of the side of the original square?

One side of original square = ——

One side of new square = x + ——

Area of square = —— × ——

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Area of new square = ——

$(x + \text{——})^2 = 100$

$x + \text{——} = \sqrt{100}$

$x + \text{——} = \text{——}$

$x = \text{——} - \text{——}$

$= \text{——}$

One side of the original square = ——

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