

## SOLUTIONS MATHEMATICS INTERNATIONAL IGCSE P2 V3

### Q. No. 1:

The square roots of the numbers using the Division method are:

a) Square root of 58900: 242.693

b) Square root of 52388619: 7237.998

c)

$$\frac{\frac{1 \times 1 + 2}{1} - \frac{2 \times 2 + 3}{2}}{\frac{3 \times 1 + 4}{1} + \frac{1 \times 6}{1}}$$

$$\frac{\frac{3}{1} - \frac{7}{2}}{\frac{7}{1} + \frac{6}{1}}$$

$$\frac{\frac{6}{2} - \frac{7}{2}}{\frac{13}{1}} = \frac{\frac{-1}{2}}{\frac{13}{1}}$$

$$\frac{\frac{-1}{2}}{\frac{13}{1}} = \frac{-1}{2} \times \frac{1}{13} = \frac{-1}{26}$$

d)

$$\frac{3}{4} \times \frac{6}{5} = \frac{18}{20} = \frac{9}{10}$$

e) Total number of people on the ship = 828

Number of people who disembarked = 389

Number of people who will reach the destination = Total number of people - Number of people who disembarked

Number of people who will reach the destination = 828 - 389

Number of people who will reach the destination = 439

So, 439 people will reach the destination.

### Q. No. 2:

a)

$$4x^2 - \frac{z^{21}}{100} = \left(2x - \frac{z^7}{10}\right) \left(4x^2 + 2x \left(\frac{z^7}{10}\right) + \left(\frac{z^7}{10}\right)^2\right)$$

b)

$$0.003^2 - 0.002^2 = (0.003 - 0.002)(0.003 + 0.002)$$

c)

$$(x+2)^2 - (x-3)^2 = (x^2 + 4x + 4) - (x^2 - 6x + 9)$$

$$x^2 + 4x + 4 - x^2 + 6x - 9 = 3x - 5$$

$$3x - 5 = 3x - 11$$

d) if Kimiya gave 18 marbles to Ramneet, they would have the same number of marbles. This can be expressed as:

$$4x - 18 = x + 18$$

Now, we can solve for

$$4x - x = 18 + 18$$

$$3x = 36$$

$$x = 12$$

So, Ramneet has 12 marbles and Kimiya has  $4 \times 12 = 48$  marbles.

e)

$$\sqrt{x^2} = \sqrt{15}$$

$$x = \pm\sqrt{15}$$

So, the solutions to the equation are:

$$x = \sqrt{15} \text{ and } x = -\sqrt{15}.$$

**Q. No. 3:**

The equation of a line in slope-intercept form is  $y=mx+b$ , where  $m$  is the slope and  $b$  is the  $y$ -intercept.

For the given points and line  $y=2x+5$ :

**(i) (1,1):**

$$1 = 2 \times 1 + 5$$

$$1 = 2 + 5$$

$$1 = 7$$

The equation does not hold, so (1,1) does not lie on the line.

**(ii) (1,3):**

$$3 = 2 \times 1 + 5$$

$$3 = 2 + 5$$

$$3 = 7$$

The equation does not hold, so (1,3) does not lie on the line.

**(iii) (3,4):**

$$4 = 2 \times 3 + 5$$

$$4 = 6 + 5$$

$$4 = 11$$

The equation does not hold, so (3,4) does not lie on the line.

**(iv) (-2,3):**

$$3 = 2 \times (-2) + 5$$

$$3 = -4 + 5$$

$$3 = 1$$

The equation does not hold, so (-2,3) does not lie on the line.

**(v) (2,9):**

$$9 = 2 \times 2 + 5$$

$$9 = 4 + 5$$

$$9 = 9$$

The equation holds, so (2,9) lies on the line.

**Q. No. 4:**

**a)** To find the gradient of the line passing through points (2,1) and (4,9), we use the formula for gradient (slope):

$$\text{Gradient: } \frac{y_2 - y_1}{x_2 - x_1}$$

Substitute the coordinates of the points into the formula:

$$\text{Gradient: } \frac{9-1}{4-2} = 4$$

**b)** The gradient of the line is 4, and it passes through the point (2,1).

$$Y - 1 = 4(x - 2)$$

$$Y - 1 = 4x - 8$$

$$Y = 4x - 7$$

So, the equation of the line with gradient 4 that passes through (2,1) is  $y = 4x - 7$ .

**c)** To check if (4,9) lies on the line  $y = 4x - 7$ , we substitute the coordinates into the equation:

$$9 = 4 \times 4 - 7$$

$$9 = 16 - 7$$

$$9 = 9$$

Since the equation holds, (4,9) lies on the line.

**Q. No. 5:**

Triangle a): The hypotenuse is the side labeled as  $c$ .

Triangle b): The hypotenuse is the side labeled as  $n$ .

Triangle c): The hypotenuse is the side labeled as  $e$ .

Triangle d): The hypotenuse is the side labeled as  $q$ .

For triangle a), the Pythagorean theorem would be:  $a^2 + b^2 = c^2$

For triangle b), the Pythagorean theorem would be:  $l^2 + m^2 = n^2$

For triangle c), the Pythagorean theorem would be:  $d^2 + f^2 = e^2$

For triangle d), the Pythagorean theorem would be:  $p^2 + r^2 = q^2$

**Q. No. 6:**

1)  $a = 60^\circ, b = 63^\circ$

2)  $c = 45^\circ, d = 70^\circ$

3)  $c = 31^\circ, e = 57^\circ, d = 52^\circ$

4)  $h = 55^\circ, f = 40^\circ, g = 55^\circ$

5)  $y = 65^\circ, m = 69^\circ$

6)  $u = 48^\circ, t = u = 48^\circ, v = 42^\circ$

**Q. No. 7:**

a) Since the probability of tossing a head is 56%, the probability of tossing a tail would be

$$100\% - 56\% = 44\%.$$

b) To find the expected number of tails when the coin is tossed 500 times, we multiply the probability of tossing a tail by the number of tosses:

Expected number of tails = Probability of tossing a tail  $\times$  Number of tosses

$$\text{Expected number of tails} = 0.44 \times 500$$

$$\text{Expected number of tails} = 220$$

Therefore, you would expect to get 220 tails when the coin is tossed 500 times.