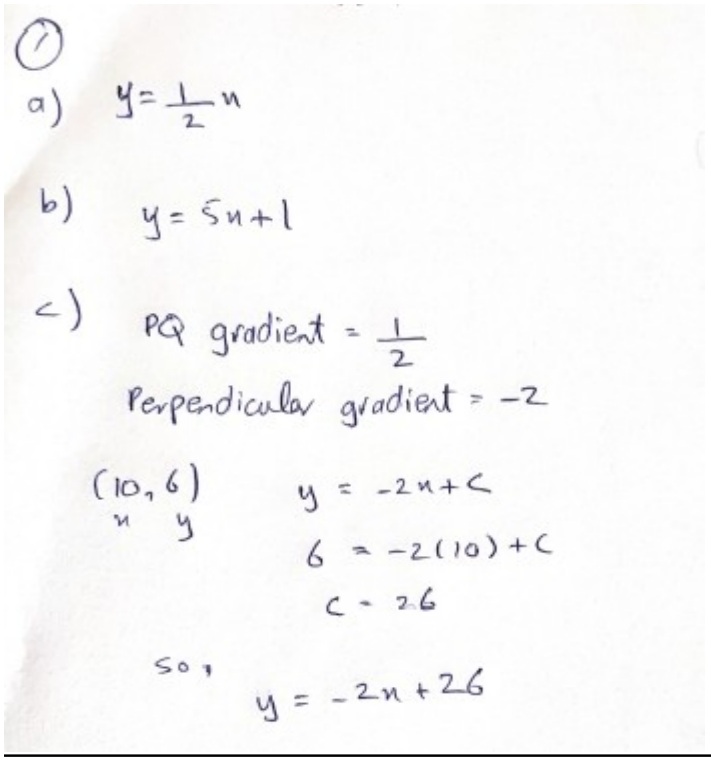
# Perpendicular lines

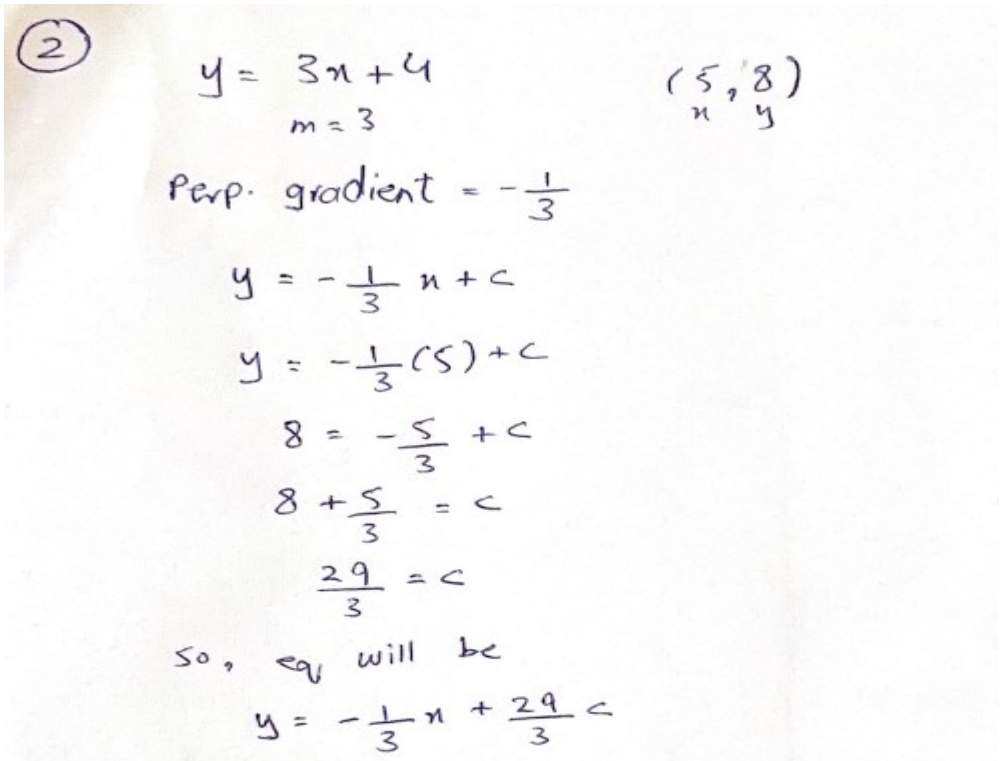
## Answers

**Q1-**




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**Q2-**




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**Q3-**

$(0,4)(2,16)$
$x_1\ y_1\ x_2\ y_2$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{16-4}{2-0}$$

$$= \frac{12}{2}$$

$$m = 6$$

$y = 6x + c$ , putting $(0, 4)$ ($x$ $y$)

$4 = 0 + c$

$c = 4$

so, $y = 6x + 4$

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**Q4**

$4y = 5x - 15$ -①

$y = \frac{5}{4} - \frac{15}{4}$

$m = \frac{5}{4}$

and

$5y = -4x + 50$ -②

$y = -\frac{4}{5}x + 10$

$m = -\frac{4}{5}$

$\frac{5}{4} \times \left(-\frac{4}{5}\right) = -1$

Both lines are perpendicular

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**Q5**

a) R

b) S

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**Q6**

(6) $(3, 6)$ and $(5, 8)$
$x_1\ y_1$ $x_2\ y_2$

(a) $(4, 7)$

(b)
$$m = \frac{8-6}{5-3}$$
$$= \frac{2}{2}$$
$$= 1$$

c) Perpendicular gradient $= -1$

$y = -x + c$

Putting $(4, 7)$

$7 = -4 + c$

$c = 11$

So, $y = -x + 11$

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**Q7**

(7) (3,6) and (12,9)

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{9-6}{12-3}$$

$$= \frac{3}{9}$$

$$= \frac{1}{3}$$

Perpendicular gradient $= -3$

$y = -3x + c$

Putting $(12, 9)$ ($x$, $y$)

$9 = -3(12) + c$

$9 = -36 + c$

$c = 45$

$y = -3x + 45$

**Q8**

(8) $x^2 + y^2 = 6$

(a) $(0, 0)$

(b) $\sqrt{6}$

c) $(0,0)\ (1,2)$
$x_1\ y_1\ x_2\ y_2$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{2 - 0}{1 - 0}$$

$$= 2$$

Perp. gradient $= -\frac{1}{2}$

$$y = -\frac{1}{2}x + c$$

Putting $(1, 2)$
$x\ y$

$$y = \frac{-1}{2}(1) + c$$

$$2 = \frac{-1}{2} + c$$

$$c = 2 + \frac{1}{2}$$

$$c = \frac{5}{2}$$

So,

$$y = -\frac{1}{2}x + \frac{5}{2}$$

**Q9**

9) Radius = 6 cm

center = (0, 0)

Point = (4, 5)

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{5 - 0}{4 - 0}$$

$$= \frac{5}{4}$$

Perpendicular gradient $= -\frac{4}{5}$

$$y = -\frac{4}{5}x + c$$

Putting (4, 5)

$$5 = -\frac{4}{5}(4) + c$$

$$5 = -\frac{16}{5} + c$$

$$5 + \frac{16}{5} = c$$

$$\frac{41}{5} = c$$

So,

$$y = -\frac{4}{5}x + \frac{41}{5}$$