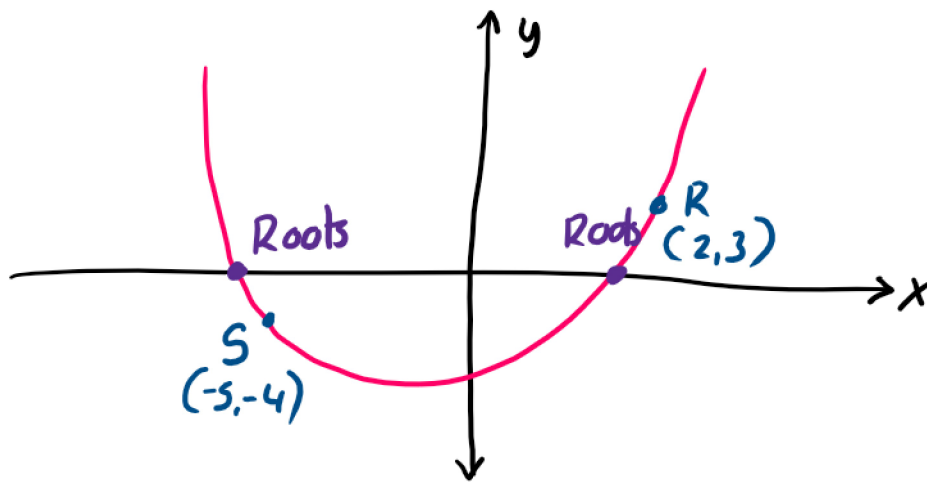


- ① The function is given as  $y = x^2 + ax + b$ , where  $a, b \in \mathbb{Z}$ , is given in the diagram



The points  $R(2, 3)$  and  $S(-5, -4)$  are points on the curve

- a) Use the given points to form two equations in  $a$  and  $b$

$$\underline{x^2 + ax + b}$$

①  $x = 2 \quad y = 3$

$$(2)^2 + a(2) + b = 3$$

$$4 + 2a + b = 3$$

$$-4 \mid 2a + b = -1 \mid -4$$

②  $x = -5 \quad y = -4$

$$(-5)^2 + a(-5) + b = -4$$

$$25 - 5a + b = -4$$

$$-25 \mid -5a + b = -29 \mid -25$$

- b) Solve your equations to find the values of  $a$  and  $b$

$$2a + b = -1$$

$$-5a + b = -29$$

(-1)

$\Rightarrow$

$$-2a - b = +1$$

$$-5a + b = -29$$

$$\underline{-1a = -28}$$

$$a=4 \Rightarrow 2a+b=-1$$

$$2(4)+b=-1$$

$$-8 \mid 8+b=-1 \mid -8$$
$$b=-9 \mid$$

$$-7a = -28$$

$$a = 4$$

$$y = x^2 + ax + b$$

$$x^2 + 4x - 9$$

c) Write down the coordinates of the point  $(x, y)$  where the curve cuts the y-axis?

y axis  $x=0$

$$y = x^2 + 4x - 9 \quad \text{y axis } x=0$$

$$y = \cancel{(0)^2} + 4\cancel{(0)} - 9$$

$$y = -9$$

Point  $(0, -9)$

d) By solving an equation, find the points where the curve cuts the x-axis. Give your answer correct to two decimal places

Roots  $y=0$  x axis

$$1x^2 + 4x - 9 = 0$$

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$a=1$$

$$b=4$$

$$c=-9$$

HW Pg 466 Q15

Exercise 16.3

15. The graph of the function  $f(x) = x^2 + kx + p$  is shown on the right.

Use the information given to find the values of  $k$  and  $p$ .

Hence find the coordinates of the point  $A$ .

