

Pre A-Level Maths Homework 2

① $A(3,3)$ $B(1,9)$

a) length = $\sqrt{(1-3)^2 + (9-3)^2}$
 $= \sqrt{4 + 36} = \sqrt{40}$

b) Mid point = $(2, 6)$

c) grad = $\frac{\text{diff } y}{\text{diff } x} = \frac{9-3}{1-3} = \frac{6}{-2} = \underline{\underline{-3}}$

d) $y = mx + c$ $m = -3$ $x = 3, y = 3$

$$3 = -3 \times 3 + c$$

$$3 = -9 + c \Rightarrow c = 12$$

$$y = -3x + 12$$

$$\underline{3x + y = 12}$$

② a) $7x - 13 - 3x = 4(7 - 4x)$
 $4x - 13 = 28 - 16x$

$$20x = 41$$

$$x = 2\frac{1}{20} \quad (2.05)$$

b) $\frac{5x-3}{4} = \frac{5-2x}{5}$

$$25x - 15 = 20 - 8x$$

$$33x = 35$$

$$x = 1\frac{2}{33}$$

③ a) $x^2 - 10x + 21 = 0$
 $(x-3)(x-7) = 0$ $x = 3, 7$

b) $x^2 + 6x - 16 = 0$
 $(x+8)(x-2) = 0$ $x = -8, +2$

c) $x^2 - 121 = 0$
 $(x+11)(x-11) = 0$ $x = 11, -11$

④ $x^2 + 10x - 2$

(a) $(x+5)^2 - 25 - 2 = (x+5)^2 - 27$

(b) $(x+5)^2 - 27 = 0$
 $(x+5)^2 = 27$
 $x+5 = \pm \sqrt{27} = \pm 3\sqrt{3}$
 $x = \underline{-5 \pm \sqrt{27}} = \underline{-5 \pm 3\sqrt{3}}$

⑤ $2x + 3y = 2$ ① $\times 4$ $8x + 12y = 8$ ③
 $5x + 4y = 12$ ② $\times 3$ $15x + 12y = 36$ ④

TAKE

$7x = 28$

into ① $8 + 3y = 2$
 $3y = -6$
 $y = \underline{\underline{-2}}$

$x = 4$

$$\textcircled{5} \quad (5) \quad y = 2x - 3 \quad 4x + 3y = 26$$

$$4x + 3(2x - 3) = 26$$

$$4x + 6x - 9 = 26$$

$$10x = 35$$

$$\underline{x = 3.5}$$

$$y = 2 \times 3.5 - 3$$

$$\underline{y = 4}$$

$$\textcircled{6} \quad (6) \quad \frac{1}{x+5} + \frac{3}{x} = \frac{x}{x(x+5)} + \frac{3(x+5)}{x(x+5)}$$

$$= \frac{x + 3x + 15}{x(x+5)}$$

$$= \frac{4x + 15}{x(x+5)}$$

$$b) \quad \frac{x}{x+4} - \frac{1}{x+5} = \frac{x(x+5)}{(x+4)(x+5)} - \frac{(x+4)}{(x+4)(x+5)}$$

$$= \frac{x^2 + 5x - x - 4}{(x+4)(x+5)}$$

$$= \frac{x^2 + 4x - 4}{(x+4)(x+5)}$$

