10

$$3x^2 - 5x + 4 = 0$$

roots are α, β

$$AM = \frac{\alpha+\beta}{2} = \frac{\frac{5}{3}}{2} = \frac{5}{6}$$

$$GM = \sqrt{\alpha\beta} = \sqrt{\frac{4}{3}} = \frac{2}{\sqrt{3}}$$

13c) $(2m-1)x^2 + (1+m)x + 1 = 0$

$\underline{\alpha = 2}$

$2+\beta = \dfrac{-(1+m)}{2m-1}$ $\qquad 2\beta = \dfrac{1}{(2m-1)}$

$2 + \dfrac{1}{2(2m-1)} = \dfrac{-(1+m)}{2m-1}$

$\dfrac{4(2m-1)+1}{2(2m-1)} = \dfrac{-(1+m)}{2m-1}$

$\underline{(8m-3)}(2m-1) = -2(2m-1)(1+m)$

$(8m-3)(2m-1) + 2(2m-1)(1+m) = 0$

$(2m-1)(8m-3+2+2m) = 0$

$(2m-1)(10m-1) = 0$

$m = \frac{1}{2}$ or $m = \frac{1}{10}$

not a
solution

13d) $(2m-1)x^2 + (1+m)x + 1 = 0$

$$\alpha + \beta = 2\alpha\beta$$

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

$$-(1+m)(2m-1) = 2(2m-1)$$

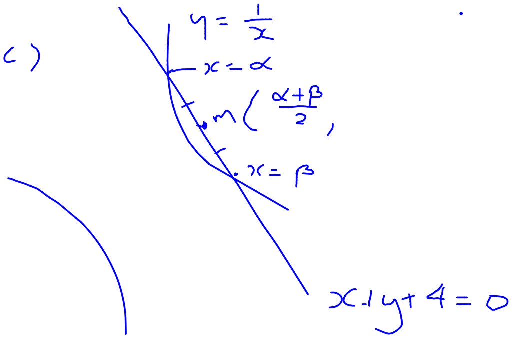
$$2(2m-1) + (1+m)(2m-1) = 0$$

$$(2m-1)(3+m) = 0$$

$m = \frac{1}{2}$ or $\underline{m = -3}$

not a solution

21(c)



$x + \frac{1}{x} + 4 = 0$

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

$\alpha + \beta = -4$

$\therefore M(-2, -2)$

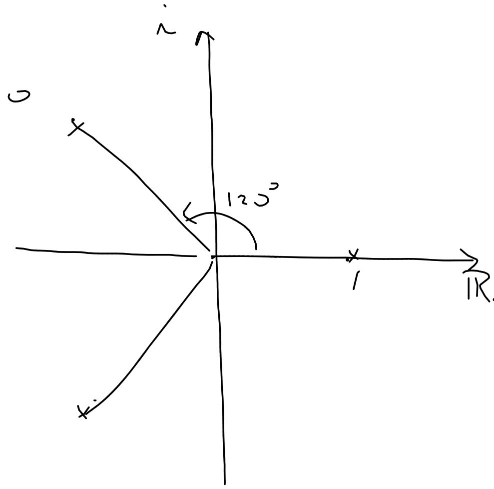
27/ $x^2 = 5x - 8 \Rightarrow x^2 - 5x + 8 = 0$

roots α, β

let $y = \sqrt[3]{x}$ $\quad y^6 = 5y^3 - 8$

$x = y^3$ $\quad y^6 - 5y^3 + 8 = 0$

$\sqrt[3]{\alpha} + \sqrt[3]{\beta} +$



$$\left(\sqrt[3]{\alpha}+\sqrt[3]{\beta}\right)^3 = A^3$$

$$\alpha + 3\sqrt[3]{\alpha^2\beta} + 3\sqrt[3]{\alpha\beta^2} + \beta = A^3$$

$$5 + 3\sqrt[3]{\alpha\beta}\left(\sqrt[3]{\alpha}+\sqrt[3]{\beta}\right) = A^3$$

$$5 + 6A = A^3$$

$$A^3 - 6A + 5 = 0$$