

Start here for  
Question Number: **1**

$$a) x^2 = 4x$$

$$x^2 - 4x = 0$$

$$x(x-4) = 0$$

$$x = 0 \quad \text{or} \quad x - 4 = 0$$

$$x = 4$$

$$\therefore x = 0, 4$$

$$b) \frac{1}{\sqrt{5}-2} = a + b\sqrt{5}$$

$$\frac{1}{\sqrt{5}-2} \times \frac{(\sqrt{5}+2)}{(\sqrt{5}+2)} = a + b\sqrt{5} \quad \rightarrow \quad \frac{\sqrt{5}+2}{(\sqrt{5}-2)(\sqrt{5}+2)} = a + b\sqrt{5}$$

~~$$\frac{\sqrt{5}+2}{5-2} = \frac{a+b\sqrt{5}}{1}$$~~

$$= \frac{\sqrt{5}+2}{5+2\sqrt{5}-2\sqrt{5}-4} = a + b\sqrt{5}$$

~~$$\frac{\sqrt{5}+2}{3} = \frac{a+b\sqrt{5}}{1}$$~~

$$= \frac{\sqrt{5}+2}{1} = a + b\sqrt{5}$$

$$= 2 + \sqrt{5} = a + b\sqrt{5}$$

$$\therefore a = 2$$

$$\therefore b = 1$$

$$c) (x-h)^2 + (y-k)^2 = r^2$$

$$\rightarrow (x+1)^2 + (y-2)^2 = 25$$

$$d) |2x+3| = 9$$

$$2x+3 = 9$$

$$2x = 6$$

$$x = 3$$

$$-(2x+3) = 9$$

$$-2x-3 = 9$$

$$-2x = 12$$

$$x = -6$$

$$* \text{ when } x = 3$$

$$|2 \times 3 + 3| = 9$$

$$|9| = 9$$

$$9 = 9$$

$$\therefore x = 3$$

$$* \text{ when } x = -6$$

$$|2 \times -6 + 3| = 9$$

$$|-9| = 9$$

$$9 = 9$$

$$\therefore x = -6$$

$$\therefore x = 3, -6$$

$$e) y = x^2 \tan x$$

$$y' = 2x \sec^2 x$$

$$f) 1 - \frac{1}{3} + \frac{1}{9} - \frac{1}{27} + \dots$$

$$S_{\infty} = \frac{a}{1-r}$$

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

$$= \frac{1}{4}$$

$$a = 1$$

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

$\therefore$  Limiting sum is  $\frac{1}{4}$

$$g) f(x) = \sqrt{x-8}$$

$$\rightarrow \text{semi-circle} \rightarrow r = 4$$

$$\text{center} = (0, 0)$$

$$\therefore \text{Domain: } -4 \leq x \leq 4$$



Additional writing space on back page.