

Assignment 1

Q1) BB

Q2) B

Q3) C

Q4) D

Q5) B

Q6) B

Q7) A

Q8) D

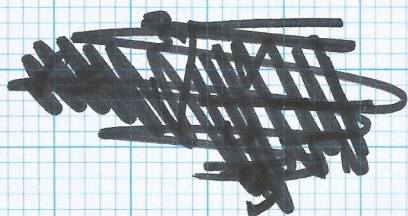
Q9) A

Q10) D

Q11)

$$a) \quad V = \frac{\frac{4}{3}\pi r^3}{\frac{4}{3}\pi}$$

$$\sqrt[3]{r^3} = \frac{\sqrt[3]{V}}{\sqrt{\frac{4}{3}\pi}}$$



$$r = \frac{\sqrt[3]{V}}{\sqrt{\frac{4}{3}\pi}}$$

b) 1L = 1000 mL

$$r = \frac{\sqrt[3]{V}}{\sqrt{\frac{4}{3}\pi}}$$

$$r = \frac{\sqrt[3]{1000}}{\sqrt{\left(\frac{4}{3} \times \pi\right)}}$$

$$r = \sqrt[3]{238.7324146}$$

$$r = 6.203504909$$

Q11) (continued)

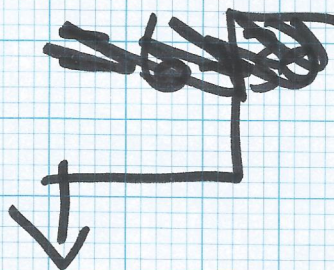
b) $r = 6.20 \text{ m}$

Q12)
$$\frac{\sqrt{6} - \sqrt{5}}{\sqrt{6} + \sqrt{5}}$$

$$\frac{\sqrt{6} - \sqrt{5}}{\sqrt{6} + \sqrt{5}} \times \frac{\sqrt{6} - \sqrt{5}}{\sqrt{6} - \sqrt{5}} = \frac{(\sqrt{6} - \sqrt{5})(\sqrt{6} - \sqrt{5})}{(\sqrt{6})^2 - (\sqrt{5})^2}$$

$$= \frac{\sqrt{36} - \sqrt{30} - \sqrt{25}}{6 - 5}$$

$$= \frac{6 - \sqrt{30} - 5}{1}$$



$$\therefore = 6 - \sqrt{30} - 5$$

(4)

Q12) Hence find the values of x and y
if ~~$\frac{\sqrt{6}-\sqrt{5}}{\sqrt{6}+\sqrt{5}}$~~ $\frac{\sqrt{6}-\sqrt{5}}{\sqrt{6}+\sqrt{5}} = x - y\sqrt{30}$

$$\frac{\sqrt{6}-\sqrt{5}}{\sqrt{6}+\sqrt{5}} = x - y\sqrt{30}$$

$$\frac{\sqrt{6}-\sqrt{5}}{\sqrt{6}+\sqrt{5}} \times \frac{\sqrt{6}-\sqrt{5}}{\sqrt{6}-\sqrt{5}} = \frac{\sqrt{6}-\sqrt{5}(\sqrt{6}-\sqrt{5})}{(\sqrt{6}+\sqrt{5})(\sqrt{6}-\sqrt{5})}$$

$$= \frac{\sqrt{6}-\sqrt{30}-\sqrt{25}}{(\sqrt{6})^2 - (\sqrt{5})^2}$$

$$= \frac{\sqrt{6}-\sqrt{30}-5}{6-5}$$

$$= \sqrt{6}-\sqrt{30}-5$$

$$= -\sqrt{24}-5$$

$$\therefore x = 24, y = 5$$

Q13)

a) $5b^2c - 15b^3c^2$

The highest common factor is $5b^2$
 $\therefore 5b^2 (bc - 3bc^2)$

b) $2 - 2a - b(1 - a)$

~~The highest common factor is 2~~
 ~~$\therefore (2 - 2a) - b(1 - a)$~~

Highest common factor is $1 - a$

$$\begin{aligned} (2 - 2a) - b(1 - a) \\ 1(1 - a) - b(1 - a) \\ = (1 - a)(1 - b) \end{aligned}$$

$$c) \frac{5b^2c - 15b^3c^2}{2 - 2a + b(1 - a)} \div \frac{5b^2}{1 - a}$$

$$= \frac{\cancel{5b^2}(bc - 3bc^2)}{\cancel{(1 - a)}(1 - b)} \div \frac{\cancel{5b^2}}{\cancel{1 - a}}$$

$$= \frac{bc - 3bc^2}{1 - b}$$

(6)

Q14)

$$a) x^2 + \overset{a+b}{9}x + \overset{ab}{20}$$

$$ab = 20$$

$$a+b = 9$$

$$20 = 4 \times 5 \text{ or } 10 \times 2$$

$$= 4 + 5 = 9$$

$$\text{So } a = 4 \quad b = 5$$

$$\text{So } x^2 + 9x + 20 = \underline{(x+4)(x+5)}$$

$$\begin{aligned} \text{Check: } (x+4)(x+5) &= x^2 + 9x + 20 \\ &= x^2 + 4x + 5x + 20 \\ &= x^2 + 9x + 20 \end{aligned}$$

$$\begin{aligned} b) \quad x^2 - 25 \\ \sqrt{x^2} - \sqrt{25} \\ = x - 5 \\ = \underline{(x-5)(x+5)} \end{aligned}$$

$$\text{Check} = \underline{(x-5)(x+5)}$$

$$\begin{aligned} x \times x &= x^2 \\ \cancel{5 \times 5} \\ -5 \times 5 &= -25 \\ \therefore x^2 - 25 \end{aligned}$$

Q14)

⑦

$$c) \frac{1}{\cancel{x^2+9x+20}} - \frac{1}{\cancel{x^2-25}} = \cancel{0} \over 9x-5$$

$$1-1=0$$

$$\cancel{x^2}-\cancel{x^2}=0$$

$$20-25=-5$$

$$\therefore \frac{0}{9x-5}$$

$$=9x-5$$

$$Q15) \quad \begin{array}{ccc} [2x-3] & = & 7 \\ +3 & & +3 \end{array}$$

$$\frac{2x}{2} = \frac{10}{2}$$

$$x=5$$

$$\begin{array}{l} \text{Check: } [2x-3] = 7 \\ \quad \quad [(2 \times 5) - 3] = 7 \\ \quad \quad [10 - 3] = 7 \\ \quad \quad \quad 7 = 7 \end{array}$$

(8)

$$\begin{aligned} \text{Q16)} \quad 8 - 3z &= 5(2 - z) + 9 \\ 8 - 3z &= 10 - 5z + 9 \\ +5z &\quad +5z \end{aligned}$$

$$\begin{aligned} 8 + 2z &= 10 + 9 \\ 8 + 2z &= 19 \\ -8 &\quad -8 \end{aligned}$$

$$\frac{2z}{2} = \frac{11}{2}$$

$$z = 5.5$$

$$\begin{aligned} \text{Check: } 8 - (3 \times 5.5) &= 10 - (5 \times 5.5) + 9 \\ 8 - 16.5 &= 10 - 27.5 + 9 \\ \therefore -8.5 &= -8.5 \end{aligned}$$

$$\begin{aligned} \text{Q17)} \quad 2^x &= 4^{x+1} \\ 2^{-2} &= 4^{(-2+1)} \\ &= 0.25 = 0.25 \end{aligned}$$

$$Q18) \frac{t^3}{4} > \frac{3t-1}{3}$$

$$4 \times \frac{3t}{4} > 3t - 1$$

$$3t > 12t - 4$$

$$-12t \quad -12t$$

$$\frac{-9t}{-9} > \frac{-4}{-9}$$

$$t > 0.44$$

$$\text{Check } \frac{0.44}{4} > \frac{(3 \times 0.44) - 1}{3}$$

$$= 0.11 > 0.11$$

$$\text{Q19)} \quad 3x^2 + 19x + 20 = 0$$

$$= (3x + 10)(x + 2)$$

$$= 3x \times x \Rightarrow 3x^2$$

$$= 10 \times 2$$

$$= 20$$

$$\therefore 3x + 10 = 0 \text{ or } x + 2 = 0$$

$$3x = 10 \text{ or } x = 2$$

$$\frac{3x}{3} = \frac{10}{3}$$

$$x = 3.3\bar{3}$$

$$x = 3.3\bar{3} \text{ or } 2$$

$$\text{Q20)} \quad (x+1)(x-2) = 10$$

$$x^2 - 2 = 10$$

$$-10 \quad -10$$

$$x^2 - 2 - 10 = 0$$

$$x^2 - 12 = 0$$

$$(x+2)(x-6) = 0$$

$$\therefore x + 2 = 0 \text{ or } x - 6 = 0$$

$$x = -2 \text{ or } 6$$

(11)

Q21) $y = x^2 - 1$ and $x + 4y - 101 = 0$

① $y = x^2 - 1$
 $8 = 3^2 - 1$
 $8 = 9 - 1$
 $8 = 8$

$\therefore x = 3, y = 8$

② $x + 4y - 101 = 0$
 $3 + 4y - 101 = 0$
 $\quad \quad \quad +101 \quad +101$

$3 + 4y = 101$
 $-3 \quad \quad -3$

$4y = 98$
 $\frac{4y}{4} = \frac{98}{4}$

$y = 24.5$

$\therefore x = 3, y = 24.5$