

Model Exam Paper 20 Question 5

Question 1

a) $2^n \times (2^{-n})^3 \times 2^{2n}$

$$= 2^n \times 2^{-3n} \times 2^{2n}$$

$$= 2^{n+(-3n)+2n}$$

$$= -2n+2n$$

$$= 2^0$$

$$= 1$$

b) $(-2ab)^2$

$$= \frac{2b}{4a^2b^2}$$

$$= 2a^2b$$

c) $3^m \times 27^m \times 9^{-m}$

$$= 3^m \times 3^{3m} \times 3^{-2m}$$

$$= 3^{m+3m+(-2m)}$$

$$= 3^{2m}$$

1) $\left(\frac{81y^8}{16x^4}\right)^{3/4}$

$$= \left(\frac{3^4 y^8}{2^4 x^4}\right)^{3/4}$$

$$= \frac{(3^4)^{3/4} (y^8)^{3/4}}{(2^4)^{3/4} (x^4)^{3/4}}$$

$$= \frac{3^3 y^6}{2^3 x^3}$$

$$= \frac{27y^6}{8x^3}$$

Question 2

a) $5 \times 8^{2/3}$

$$= 5 \times (2^3)^{2/3}$$

$$= 5 \times 2^2$$

$$= 5 \times 4$$

$$= 20$$

b) $(-243)^{-2/5}$

$$= (-3^5)^{-2/5}$$

$$= (-3)^{-2}$$

$$= \frac{1}{(-3)^2}$$

$$= \frac{1}{9}$$

$$= \frac{1}{9}$$

$$= \frac{1}{9}$$

c) $3 \times 5^x = \frac{3}{125}$

$$= \frac{3 \times 5^x}{1 \times 5^3}$$

$$= \frac{3 \times 5^x}{3 \times 5^3} = \frac{1}{5^3}$$

$$= 5x = 5^3$$

$$\therefore x = 3$$

Question 3

a) $\frac{9^{1/2} \times 8^{1/2}}{2^{1/2}}$

$$= \frac{(3^2)^{1/2} (2^3)^{1/2}}{2^{1/2}}$$

$$= 3 \cdot 2^{2/2 - 1/2}$$

$$= 3 \cdot 2$$

$$= 6$$

b) $\frac{8^{1/3} \times 16^{1/3}}{32^{1/3}}$

$$= \frac{(2^3)^{1/3} (2^4)^{1/3}}{(2^5)^{1/3}}$$

$$= 2^{1 + \frac{4}{3} - \frac{5}{3}}$$

$$= 2^{\frac{3}{3} - \frac{1}{3} - (-\frac{5}{3})}$$

$$= 2^{\frac{7+5}{3}}$$

$$= 2^{\frac{12}{3}}$$

$$= 2^4$$

$$= 16$$

checked
7/12/18