Einstein Jyuba Ita

Final Exam

Date No.

Question 5

a)i) $\frac{6^2 x^6}{6^5}$

$= \frac{x^6}{6^{5-2}}$

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

$= \frac{x^6}{216}$ ✓

$= 6^{2-5} x^6$

$= 6^{-3} x^6$

$= \frac{1}{6^3} x^6$

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

ii) $(2^n \times 8^{2n})^{\frac{1}{n}}$

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

$= (2^n \times 2^{6n})^{\frac{1}{n}}$

$= (2^{7n})^{\frac{1}{n}}$

$= 2^7$

$= 128$ ✓

b) i) $\frac{4^{2x+1}}{4^{3+x} \times 4^{2+x}}$

$= \frac{4^{2x+1}}{4^{2x+5}}$ ✓ ✓

$= \frac{1}{4^{2x+5-(2x+1)}}$ ✓

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

$= \frac{1}{4^{5-1}}$

$= \frac{1}{4^4}$ ✓

$= \frac{1}{256}$ ✓

$2x+1-(2x+5)$

$\alpha \; 4^{2x+1-2x-5}$

$= 4^{-4}$

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

ii) $\frac{7^{2(k+3)} \times 7^{3k+2} \times 7^{2-k}}{49^{5+3k}}$ ✓ ✓ ✓

$= \frac{7^{2k+6} \times 7^{3k+2} \times 7^{2-k}}{(7^2)^{5+3k}}$ ✓ ✓

$= \frac{7^{2k+6+3k+2+2-k}}{7^{10+6k}}$ ✓ ✓

$= \frac{7^{4k+10}}{7^{10+6k}}$ ✓

$= 7^{4k+10-(10+6k)}$ ✓

$= 7^{4k+10-10-6k}$ ✓

$= 7^{4k-6k}$ ✓

$= 7^{-2k}$ ✓

$= \frac{1}{7^{2k}}$ ✓

$= \frac{1}{49^k}$ ✓

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c)i) $27^{2x+10} = 9^{3x}(3^{5x})$

$(3^3)^{2x+10} = (3^2)^{3x} \times 3^{5x}$ ✓

$3^{6x+30} = 3^{6x} \times 3^{5x}$ ✓

$3^{6x+30} = 3^{11x}$ ✓

$6x+30 = 11x$ ✓

$6x+30-30 = 11x-30$

$6x-11x = 11x-11x-30$

$\frac{-5x}{-5} = \frac{-30}{-5}$

$x = 6$ ✓

ii) $8^{3k} - 64^{5-k} = 0$

$8^{3k} - (8^2)^{5-k} = 0$ ✓

$8^{3k} - 8^{10-2k} = 0$ ✓

$3k-(10-2k) = 0$

$3k-10+2k = 0$ ✓

$3k-10+10+2k = 10$

$\frac{5k}{5} = \frac{10}{5}$ ✓

$k = 2$ ✓

Checked.
29/9/18.