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WORKSHEET

INDICES

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QUESTION 1

Simplify each of the following

(i) $a^7 \times a^3 \div (a^3)^2$

(ii) $(2b)^5 \div 8b^2$

(iii) $\left(\frac{3x^2}{x^3}\right)^3 \div \frac{27x^7}{x^{21}}$

(iv) $(c^2d)^4 \times (c^4d^3)^5$

(v) $5(ef)^3 \times 10ef^2$

(vi) $16m^8n^7 \div (-2m^3n^2)^2$

(vii) $\left(\frac{p^2}{q}\right)^6 \times \left(\frac{2q^2}{-3p^5}\right)^3$

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QUESTION 2

Simplify each of the following, giving your answers in positive index notation.

(i) $18a^{-6} \div 3(a^{-2})^2$

(ii) $5b^0 \times 3(b^{-2})^2$

(iii) $(3c^2d^{-2})^2$

(iv) $\left(\frac{e^2f^{-1}}{2}\right)^{-3}$

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QUESTION 3

Evaluate each of the following without the use of a calculator.

(i) $\sqrt[4]{16}$

(ii) $\sqrt[3]{\frac{27}{125}}$

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QUESTION 4

Rewrite each of the following in radical form and hence evaluate the results without using a calculator.

(i) $81^{\frac{1}{4}}$

(ii) $8^{-\frac{1}{3}}$

Worksheet: Indices

QUESTION 5

Solve each of the equation.

(i) $2^x = 8$

(ii) $5^y = \frac{1}{25}$

(iii) $9^z = 27$

QUESTION 6

Use an appropriate substitution, or otherwise, solve $7^{2x+1} + 20(7^x) = 3$.

QUESTION 7

Solve the simultaneous equations,

$$4^x(2^y) = \frac{2^{11}}{16^y}$$

$$5^x(5^{x-6y}) = 1$$