EQUITY
LEARNING PLACE

Elementary Math Topical (Indices)

Question 1:

Simplify $\left(\frac{a}{b^3}\right)^{-2} \times \left(4a^2b^4\right)^{\frac{1}{2}}$, expressing your answer in positive indices.

Question 2:

Solve the equation $9^{2x-1} = 27^x$.

Question 3:

Solve the following equations:

a) $5 \times 5^{2n-2} = 125$

b) $\left(\frac{1}{3^x}\right)^2 = \sqrt{27}$

Question 4:

Simplify $x^{\frac{4}{3}} \div \sqrt[3]{x^2}$

Question 5:

Simplify the following, expressing your answers in positive index notation whenever possible.

a) $\left(2m^2\right)^3$,

b) $1 \div 5n^{-3}$,

c) $p^n \times p^{-n}$,

d) $\frac{\sqrt[3]{t^4}}{t}$.

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Question 6:

Solve

a) $5^{-4} \times 125^{p} = 15^{0}$,

b) $4 \times 10^{3f-2} = 0.004$

Question 7:

Simplify $\frac{3x^2}{z^2} \div \frac{9x}{14yz}$

Question 8:

Solve for *n* if $\frac{x^{2n}}{x^{-3}} = \sqrt{x} \times x^{5}$.

Question 9:

Solve $x^{\frac{2}{3}} = 5.$

Question 10:

Simplify each of the following and express your answers in positive indices.

a) $(-2x^{-1})^{-3}$

b) $\frac{p^3}{q^{-4}} \div \left(\frac{3p}{2q}\right)^2$

Question 11:

Given that $8^{n} = 4$, find the value of *n*.

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Question 12:

Given that $5^m = p$ and $7^m = q$, express the following in terms of *p* and/or *q*.

a) 5^{1-m}

b) 35^m

c) $\left(\frac{7^{-1}}{25}\right)^m$

Question 13:

Without the use of a calculator and showing your workings clearly, evaluate $9^{\frac{3}{8}} \times \sqrt{3^{\frac{1}{2}}}$

Question 14:

a) Simplify $-2\frac{2}{3} \div \frac{16df^3}{3d^2e}$

b) Simplify $a^4 \times a \div \sqrt[3]{a}$ and give your answer in the form a^n.

Question 15:

Given $4^2 \div 8^{2x} = \frac{1}{64}$, find the value of x.

Question 16:

a) Given that $25 \times \frac{1}{125} = 5^m$, find the value of m.

b) Simplify $9x^2y^3 \div 6x^4y^{-2}$

c) $\left(\frac{z^6}{27}\right)^{-\frac{1}{3}}$

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Question 17:

Simplify $6k^0 + \sqrt{k} \times \sqrt{k} \times k^2$.

Question 18:

Simplify $(\sqrt[3]{3}a^2b^{-3})^3 \times \left(\frac{a^{-3}b}{-2}\right)^2$, leaving your answer in positive index.

Question 19:

Simplify the following expressions and give your answers in positive index notation.

a) $(3a^0 + 2)^0 - 1$

b) $\left(2b^{-2}\right)^{-3}$

Question 20:

Solve $(3^{\frac{1}{2}})^{4+2x} = \frac{27}{3^x}$

Question 21:

If $27a^{3x} = 1$ and $a > 0$, find $a^{2x} - a^{-x}$.

Question 22:

a) Simplify $x^{\frac{1}{2}} \times \left(\frac{1}{\sqrt{x}}\right)^{-1}$

b) Given that $(x^2y^p \div x^qy^4)^3 = x^3$, find the values of *p* and *q*.

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Question 23:

Solve the equation $81^{3x-2} = \left(\frac{1}{27}\right)^{x-1}$

Question 24:

Simplify $qp^3 \times (q^2)^3 \div p^2$, expressing your answer in the form $p^a q^b$.

Question 25:

a) Given that $\frac{1}{8} = 2^k$, find *k*.

b) Given that $9 \times 27^{\frac{1}{5}} = 3^n$, find *n*.

c) Solve the equation $27^{x+\frac{1}{3}} - 1 = 0$.

Question 26:

a) Simplify $\frac{(5x)^0 \times \sqrt{x^{12}}}{5x^{-3}}$

b) Given $\frac{243}{27^{\frac{p}{2}}} = 9$, find the value of *p*.

Question 27:

Express the following as a power of 5:

a) $\frac{1}{25}$

b) 1

c) $\sqrt{5}$

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Question 28:

Simplify the following

a) $(3x)^2 \times (2x^3y^2)^0$

b) $\left(\frac{1}{x}\right)^{-3} + 7x^3$

c) Solve $3^{2q} \times 27^q = 729$

Question 29:

a) Solve the equation $\frac{3^{\frac{x}{2}}}{9} = \frac{1}{\sqrt{27^x}}$.

b) Simplify $\frac{4}{b^2a^{-2}} \div \frac{2a}{b^3}$, expressing your answer in positive indices.

Question 30:

Solve for x if $5^9 \div 625 = (\sqrt{5})^x$.

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