Logarithms & Equations

Questions

Rational Exponents

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Equations

Rational Exponents

Q1) Evaluate the following.

a) $8^{\frac{1}{3}}$

b) $121^{\frac{1}{2}}$

c) $25^{-\frac{1}{2}}$

d) $9^{\frac{3}{2}}$

e) $16^{\frac{3}{4}}$

f) $27^{\frac{2}{3}}$

g) $32^{\frac{1}{5}}$

h) $8^{-\frac{5}{3}}$

Logarithms

Q1) Rewrite these exponential expressions as logarithms.

a) $2^7 = 128$

b) $5^3 = 125$

c) $3^3 = 27$

d) $4^3 = 64$

e) $4^t = p$

f) $f = g^h$

Q2) Rewrite these logarithmic expressions as logarithms.

a) $3 = \log_2 8$

b) $\log_3 243 = 5$

c) $y = \log_5 4$

d) $2 = \log_4 16$

e) $0 = \log_x 1$

f) $\log_5 625 = 4$

Q3) Simplify the following expressions.

a) $\log_2 8 + 3\log_2 4 - \log_2 16$

b) $\log_5 25 + 3\log_2 \sqrt[3]{2}$

c) $3\log_{10} 5 + \log_{10} 8$

d) $\log_4 36 - 2\log_4 12$

Q4) Solve the following equations for x.

a) $\log_2 32 = x$

b) $\log_4 64 = \frac{x}{2}$

c) $\log_a x - \log_a 7 = \log_a 4$

d) $\log_a 18 - \log_a(x-1) = \log_a 9$

e) $\log_3(x-1) + \log_8 64 = 2$

f) $2\log_2(x+1) - \log_2(2x) = 1$

Equations

Q1) Solve the following linear equations by removing the fraction.

a) $\frac{x+1}{4} = 5$

b) $\frac{x}{2} - \frac{x}{3} = 4$

c) $\frac{4x}{5} - \frac{x}{2} = 3$

d) $\frac{2}{x} + \frac{1}{3} = 5$

e) $2x - \frac{(3x-1)}{2} = 4$

f) $\frac{a-1}{2} = \frac{a+1}{4}$

Q2) Solve the following equations.

a) $6\sqrt{x} = 12$

b) $\sqrt{x+5} = 4$

c) $\frac{\sqrt{x-3}}{4} = 1$

d) $\frac{10}{\sqrt{x}} = 5$

e) $7\sqrt[3]{5x-3} - 21 = 0$

f) $\frac{2}{\sqrt[4]{x+3}} = 6$

Q3) Solve the following systems of equations.

a) $x + y = 11$
$xy = 30$

b) $y = 3x$
$2y^2 - xy = 15$

c) $3x + y = 8$
$3x^2 + y^2 = 28$

d) $3x + 2y = 7$
$x^2 + y = 8$