



CAMI Mathematics: Grade 11

GRADE 11_Rational exponents

11.4 Expressions with rational exponents

1. Simplify

(a) $\sqrt{\frac{25e^8}{6^2q^{12}}}$

(b) $\sqrt{\frac{3^2y^{16}}{36d^4}}$

(c) $(w^{\frac{1}{3}}x^{\frac{1}{3}})^{\frac{1}{2}} \cdot (w^{\frac{1}{2}}x^{\frac{5}{4}})^{\frac{2}{3}}$

(d) $(v^{\frac{4}{3}} + w^{\frac{2}{3}})^2$

(e) $\sqrt{25x^{10}}$

2. Write the following in surd form

(a) $q^{\frac{2}{5}}$

(b) $b^{\frac{3}{5}}$

(c) $\frac{1}{3^{\frac{7}{3}}}$

(d) $5^{\frac{-2}{5}}$

(e) $6^{\frac{1}{5}}$



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MEMO

1. Simplify [4.3.1.6; 4.3.3.6; 4.3.3.5; 4.3.5.4]

(a)

$$\sqrt{\frac{25e^8}{6^2q^{12}}} = \frac{5e^4}{6q^6}$$

(b)

$$\sqrt{\frac{3^2y^{16}}{36d^4}} = \frac{3y^8}{6d^2}$$

(c)

$$\begin{aligned} & (w^{\frac{1}{3}}x^{\frac{1}{3}})^{\frac{1}{2}} \cdot (w^{\frac{1}{2}}x^{\frac{5}{4}})^{\frac{2}{3}} \\ &= w^{\frac{1}{6}}x^{\frac{1}{6}} \cdot w^{\frac{2}{6}}x^{\frac{10}{6}} \\ &= w^{\frac{1}{6}}x^{\frac{1}{6}}w^{\frac{2}{6}}x^{\frac{5}{6}} \\ &= w^{\frac{3}{6}}x^{\frac{6}{6}} \\ &= w^{\frac{1}{2}}x \end{aligned}$$

(d)

$$\begin{aligned} & (v^{\frac{4}{3}} + w^{\frac{2}{3}})^2 \\ &= (v^{\frac{4}{3}} + w^{\frac{2}{3}})(v^{\frac{4}{3}} + w^{\frac{2}{3}}) \\ &= v^{\frac{8}{3}} + 2w^{\frac{2}{3}}v^{\frac{4}{3}} + w^{\frac{4}{3}} \end{aligned}$$

(e)

$$\sqrt{25x^{10}} = 5x^5$$

2. Write the following in surd form [4.3.5.4]

(a) $q^{\frac{2}{5}} = \sqrt[5]{q^2}$

(b) $b^{\frac{3}{5}} = \sqrt[5]{b^3}$



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$$(c) \frac{1}{3^{\frac{7}{3}}} = 3^{-\frac{7}{3}} = \sqrt[3]{3^{-7}} = \sqrt[3]{\frac{1}{3^7}}$$

$$(d) 5^{\frac{-2}{5}} = \sqrt[5]{5^{-2}} = \sqrt[5]{\frac{1}{5^2}}$$

$$(e) 6^{\frac{1}{5}} = \sqrt[5]{6}$$

