Indices Exercises Blue Textbook Pages 214 - 215

Exercise 10c

8 c) $\dfrac{3abc \times 4a^3b^2c \times 6c^2}{9a^2bc} = \dfrac{72a^4b^3c^4}{9a^2bc}$

$= 8a^2b^2c^3$

EXERCISE 10D

Evaluate the following.

1 $25^{\frac{1}{2}}$	2 $100^{\frac{1}{2}}$	3 $64^{\frac{1}{2}}$	4 $81^{\frac{1}{2}}$	5 $625^{\frac{1}{2}}$
6 $27^{\frac{1}{3}}$	7 $64^{\frac{1}{3}}$	8 $1000^{\frac{1}{3}}$	9 $125^{\frac{1}{3}}$	10 $512^{\frac{1}{3}}$
11 $144^{\frac{1}{2}}$	12 $400^{\frac{1}{2}}$	13 $625^{\frac{1}{4}}$	14 $81^{\frac{1}{4}}$	15 $100\,000^{\frac{1}{5}}$
16 $729^{\frac{1}{6}}$	17 $32^{\frac{1}{5}}$	18 $1024^{\frac{1}{10}}$	19 $1296^{\frac{1}{4}}$	20 $216^{\frac{1}{3}}$
21 $16^{-\frac{1}{2}}$	22 $8^{-\frac{1}{3}}$	23 $81^{-\frac{1}{4}}$	24 $3125^{-\frac{1}{5}}$	25 $1\,000\,000^{-\frac{1}{6}}$
26 $\left(\frac{25}{36}\right)^{\frac{1}{2}}$	27 $\left(\frac{100}{36}\right)^{\frac{1}{2}}$	28 $\left(\frac{64}{81}\right)^{\frac{1}{2}}$	29 $\left(\frac{81}{25}\right)^{\frac{1}{2}}$	30 $\left(\frac{25}{64}\right)^{\frac{1}{2}}$
31 $\left(\frac{27}{125}\right)^{\frac{1}{3}}$	32 $\left(\frac{8}{512}\right)^{\frac{1}{3}}$	33 $\left(\frac{1000}{64}\right)^{\frac{1}{3}}$	34 $\left(\frac{64}{125}\right)^{\frac{1}{3}}$	35 $\left(\frac{512}{343}\right)^{\frac{1}{3}}$

PROOF 36 Use the general rule for raising a power to another power to prove that $x^{\frac{1}{n}}$ is equivalent to $\sqrt[n]{x}$

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5) $625^{\frac{1}{2}} = \sqrt{625} = 25$

10) $512^{\frac{1}{3}} = \sqrt[3]{512} = 8$

15) $100,000^{\frac{1}{5}} = \sqrt[5]{100,000} = 10$

20) $216^{\frac{1}{3}} = \sqrt[3]{216} = 6$

25) $1,000,000^{-\frac{1}{6}} = \dfrac{1}{1000000^{\frac{1}{6}}} = \dfrac{1}{10}$

30) $\left(\frac{25}{64}\right)^{\frac{1}{2}} = \sqrt{\frac{25}{64}} = \frac{5}{8}$

35) $\left(\frac{512}{343}\right)^{\frac{1}{3}} = \sqrt[3]{\frac{512}{343}} = \frac{8}{7}$

Complete the rest of Exercise 6D

EXERCISE 10E

1 Evaluate the following.

a $32^{\frac{4}{5}}$ b $125^{\frac{2}{3}}$ c $1296^{\frac{3}{4}}$ d $243^{\frac{4}{5}}$

2 Rewrite the following in index form.

a $\sqrt[3]{t^2}$ b $\sqrt[4]{m^3}$ c $\sqrt[5]{k^2}$ d $\sqrt{x^3}$

3 Evaluate the following.

a $8^{\frac{2}{3}}$ b $27^{\frac{2}{3}}$ c $16^{\frac{3}{2}}$ d $625^{\frac{5}{4}}$

4 Evaluate the following.

a $25^{-\frac{1}{2}}$ b $36^{-\frac{1}{2}}$ c $16^{-\frac{1}{4}}$ d $81^{-\frac{1}{4}}$

e $16^{-\frac{1}{2}}$ f $8^{-\frac{1}{3}}$ g $32^{-\frac{1}{5}}$ h $27^{-\frac{1}{3}}$

5 Evaluate the following.

a $25^{-\frac{3}{2}}$ b $36^{-\frac{3}{2}}$ c $16^{-\frac{3}{4}}$ d $81^{-\frac{3}{4}}$

e $64^{-\frac{4}{3}}$ f $8^{-\frac{2}{3}}$ g $32^{-\frac{2}{5}}$ h $27^{-\frac{2}{3}}$

6 Evaluate the following.

a $100^{-\frac{5}{2}}$ b $144^{-\frac{1}{2}}$ c $125^{-\frac{2}{3}}$ d $9^{-\frac{3}{2}}$

e $4^{-\frac{5}{2}}$ f $64^{-\frac{5}{6}}$ g $27^{-\frac{4}{3}}$ h $169^{-\frac{1}{2}}$

1d) $243^{\frac{4}{5}} = \left(\sqrt[5]{243}\right)^4 = 3^4 = 81$

2d) $\sqrt[2]{x^3} = x^{3/2}$

3d) $625^{5/4} = \left(\sqrt[4]{625}\right)^5 = 5^5 = 3125$

4d) $81^{-\frac{1}{4}} = \frac{1}{81^{\frac{1}{4}}} = \frac{1}{\sqrt[4]{81}} = \frac{1}{3}$

4h) $27^{-\frac{1}{3}} = \frac{1}{27^{1/3}} = \frac{1}{\sqrt[3]{27}} = \frac{1}{3}$

5d) $81^{-\frac{3}{4}} = \frac{1}{81^{3/4}} = \frac{1}{(\sqrt[4]{81})^3} = \frac{1}{3^3} = \frac{1}{27}$

5h) $27^{-\frac{2}{3}} = \frac{1}{27^{2/3}} = \frac{1}{(\sqrt[3]{27})^2} = \frac{1}{3^2} = \frac{1}{9}$

6d) $9^{-3/2} = \frac{1}{9^{3/2}} = \frac{1}{(\sqrt{9})^3} = \frac{1}{3^3} = \frac{1}{27}$

6h) $169^{-\frac{1}{2}} = \frac{1}{169^{1/2}} = \frac{1}{13}$

Complete the rest of Exercise 10E
