Q's on 7.2

69. $\sqrt[3]{8x^2}$

$= (8x^2)^{1/3}$

$= (2^3 x^2)^{1/3}$

$= 2^{\frac{3}{1}\cdot\frac{1}{3}} x^{\frac{2}{1}\cdot\frac{1}{3}}$

$= 2x^{2/3}$

89. $\dfrac{(k^{1/2})^{-3}}{(k^2)^{1/4}}$

$= \dfrac{k^{\frac{1}{2}\cdot\frac{-3}{1}}}{k^{\frac{2}{1}\cdot\frac{1}{4}}}$

$= \dfrac{k^{-\frac{3}{2}}}{k^{1/2}}$

$= \dfrac{1}{k^{3/2}\cdot k^{1/2}}$

$= \dfrac{1}{k^{3/2+1/2}}$

$= \dfrac{1}{k^{4/2}}$

$= \dfrac{1}{k^2}$

$\dfrac{1}{k^2\cdot k^1} = \dfrac{1}{k^3}$

$x \cdot x = x^2$

$\dfrac{1}{k^{1/2-(-\frac{3}{2})}}$

$\dfrac{t^{-\frac{3}{2}}}{k^{1/2}}$

$= \dfrac{1}{t^{+3/2}k^{1/2}}$

31. $\dfrac{1}{\sqrt{x+1}} = (x+1)^{-1/2}$ $\qquad \dfrac{1}{x} = x^{-1}$

53. $\left(\frac{1}{8}\right)^{-1/3} = 8^{1/3} = \sqrt[3]{8} = 2$

negative exponent flips base

23. typo

$(x+5)^{1/2} = \sqrt{x+5}$

71. $\dfrac{\sqrt{49x}}{\sqrt[3]{x^2}} = \dfrac{7x^{1/2}}{(x^{\frac{2}{1}})^{1/3}} = \dfrac{7x^{1/2}}{x^{2/3}}$

$= 7x^{1/2 \cdot \frac{3}{3} - 2/3 \cdot 2}$

$= 7x^{\frac{3}{6} - \frac{4}{6}}$

$= 7x^{-\frac{1}{6}}$

$= \dfrac{7}{x^{1/6}}$

$\dfrac{x^3}{x^7}$

$\dfrac{1}{x^4}$

7.2

95. $\sqrt[3]{x}\left(\sqrt{x} - \sqrt[3]{x^2}\right)$

$= \sqrt[3]{x} \cdot \sqrt{x} - \sqrt[3]{x^1}\sqrt[3]{x^2}$

$= x^{1/3} \cdot x^{1/2} - \sqrt[3]{x^3}$

$= x^{\frac{2}{6}+\frac{3}{6}} - x$

$= x^{5/6} - x$

$x^1 - x^1$

$= 0$

Section 7.3 – Simplifying Radical Expressions

Combining Radicals

Multiplication $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$

Division $\dfrac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\dfrac{a}{b}}$

12. $\sqrt{2} \cdot \sqrt{18} = \sqrt{36} = 6$

14. $\sqrt[3]{-2} \cdot \sqrt[3]{-4} = \sqrt[3]{8} = 2$

$\sqrt[3]{2^3} = 2$

$1^3 = 1$
$2^3 = 8$
$3^3 = 27$
$4^3 = 64$
$5^3 = 125$

30. $\sqrt{\dfrac{x^2}{81}} = \dfrac{x}{9}$

Directions: Assume all variables are positive so we don't need absolute value bars.

18. $\sqrt[3]{\dfrac{x}{8}} = \dfrac{\sqrt[3]{x}}{\sqrt[3]{8}} = \dfrac{\sqrt[3]{x}}{2}$ also $= \dfrac{x^{1/3}}{2}$

$\sqrt{x} = \sqrt{x}$

7.1 the variable can be anything so we need ||

$\sqrt{x^2} = |x|$ $\quad \sqrt[3]{x^3} = x$

$\sqrt[4]{x^4} = |x|$ $\quad \sqrt[5]{x^5} = x$

44. $\dfrac{\sqrt[3]{x^3y^7}}{\sqrt[3]{y^4}} = \sqrt[3]{\dfrac{x^3y^7}{y^4}} = \sqrt[3]{x^3y^3} = xy$

$= x^{\frac{3}{3}} y^{\frac{3}{3}\cdot\frac{1}{3}} = xy$

60. $\sqrt[5]{3z^2} \cdot \sqrt[5]{7z} = \sqrt[5]{21z^3}$

ex: $\sqrt[5]{125x^5} = 5x$

$\sqrt[5]{125x^6} = \sqrt[5]{125x^5} \cdot \sqrt[5]{x}$

$= 5x\sqrt[5]{x}$

ex: $\sqrt{18} = \sqrt{9}\cdot\sqrt{2}$

$= 3\sqrt{2}$

84. $\sqrt{t^3} = \sqrt{t^2}\cdot\sqrt{t}$ square root so look for groups of 2 t^2 x^2

$= t\sqrt{t}$ squared

86. $\sqrt{32a^2} = \sqrt{16a^2}\sqrt{2}$ ← not squares

$= 4a\sqrt{2}$

88. $\sqrt{20a^3b^2} = \sqrt{4a^2b^2}\cdot\sqrt{5a}$

$= 2ab\sqrt{5a}$

$\sqrt{20a^4b^2} = \sqrt{4a^4b^2}\sqrt{5}$

$= (a^2)^2$

$2ab\sqrt{5a}$

$= \sqrt{(2ab)^2 \cdot 5a}$

$= \sqrt{4a^2b^2 \cdot 5a}$

$= \sqrt{20a^3b^2}$

$$2a^2b\cdot\sqrt{5}$$
$$=2a^2b\sqrt{5}$$

$$\sqrt{a^6} = \sqrt{(a^2)^3} \qquad a^{6\cdot\frac{1}{2}}$$
$$= \sqrt{(a^3)^2} \qquad = a^{\frac{6}{2}}$$
$$= a^3 \qquad = a^3$$

90. ~~$\sqrt[3]{-2\cdot 11}$~~

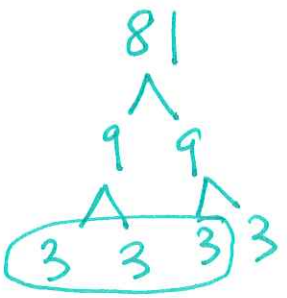
$\sqrt[3]{-81a^5b^2}$ Look for perfect cubes and groups of 3

$= \sqrt[3]{(-3)^3\cdot 3a^5b^2}$

$= \sqrt[3]{(-3)^3a^3}\cdot\sqrt[3]{3a^2b^2}$

cubes — not cubes

$= -3a\sqrt[3]{3a^2b^2}$



94. $\sqrt[5]{\frac{4t^6}{r^1}}\cdot\sqrt[5]{\frac{8t^1}{r^6}} = \sqrt[5]{\frac{32t^7}{r^7}}$ (5 perfect groups of 5)

$= \sqrt[5]{\frac{2^5t^5}{r^5}}\cdot\sqrt[5]{\frac{t^2}{r^2}}$

$= \frac{2t}{r}\sqrt[5]{\frac{t^2}{r^2}}$