099 §7.3 #s 1, 5, 9, 13, 17, ..., 73, 76, 81, 85, 89

every 4th

#s 1–12 Use product rule

(1) $\sqrt{7}\sqrt{2} = \boxed{\sqrt{14}}$

(5) $\sqrt[3]{4}\sqrt[3]{9} = \boxed{\sqrt[3]{36}}$

(9) $\sqrt{\frac{7}{x}}\sqrt{\frac{2}{y}} = \boxed{\sqrt{\frac{14}{xy}}}$

#s 13–30 Use quotient rule

(13) $\sqrt{\frac{6}{49}} = \frac{\sqrt{6}}{\sqrt{49}} = \boxed{\frac{\sqrt{6}}{7}}$

(17) $\sqrt[4]{\frac{x^3}{16}} = \frac{\sqrt[4]{x^3}}{\sqrt[4]{16}} = \boxed{\frac{\sqrt[4]{x^3}}{2}}$

(21) $\sqrt[4]{\frac{8}{x^8}} = \frac{\sqrt[4]{8}}{\sqrt[4]{x^8}} = \boxed{\frac{\sqrt[4]{8}}{x^2}}$

(25) $\sqrt{\frac{x^2y}{100}} = \frac{\sqrt{x^2}\sqrt{y}}{\sqrt{100}} = \frac{|x|\sqrt{y}}{10}$

I think your book assumes $x \geq 0$, so $|x|$ simplifies to x, giving

$$\boxed{\frac{x\sqrt{y}}{10}}$$

099 S^N 7.3 #s 29, 33, 111, 73, 76, 81, 85, 89

(29) $-\sqrt[3]{\frac{z^7}{27x^3}} = \frac{\sqrt[3]{z^6 z^1}}{\sqrt[3]{27}\sqrt[3]{x^3}} = \boxed{\frac{z^2\sqrt[3]{z^1}}{3x}}$

#s 31-58 Simplify

(33) $\sqrt[3]{192} = \sqrt[3]{2^6 \cdot 3} = (2^6 \cdot 3)^{\frac{1}{3}}$

$= (2^6)^{\frac{1}{3}}(3)^{\frac{1}{3}} = 2^{\frac{6}{3}}\sqrt[3]{3} = \boxed{2^2\sqrt[3]{3}}$

2 | 192
2 | 96
2 | 48
2 | 24
2 | 12
2 | 6
3

(37) $\sqrt{24} = \sqrt{2^3 \cdot 3} = \sqrt{2^2 \cdot 2 \cdot 3}$

$= \sqrt{2^2}\sqrt{6} = \boxed{2\sqrt{6}}$

(41) $\sqrt[3]{16y^7} = \sqrt[3]{2^4 y^7} = \sqrt[3]{2^3 \cdot 2 \cdot y^6 \cdot y}$

$= 2^{\frac{3}{3}} y^{\frac{6}{3}}\sqrt[3]{2y} = 2y^2\sqrt[3]{2y}$

(45) $\sqrt{y^5} = \sqrt{y^4 y^1} = y^{\frac{4}{2}}\sqrt{y} = \boxed{y^2\sqrt{y}}$

(49) $\sqrt[5]{-32x^{10}y} = -\sqrt[5]{2^5 x^{10} y} = \boxed{-2x^2\sqrt[5]{y}}$

$x^{\frac{10}{5}} = x^2$

(53) $-\sqrt{32a^8b^7}$

$= -\sqrt{2^5 a^8 b^7} = -\sqrt{2^4 a^8 b^6 \cdot 2b} = \boxed{-2^2 a^4 b^3\sqrt{2b}}$

$= -4a^4b^3\sqrt{2b}$

099 §7.3 #s 57, 61, ..., 73, 76, 81, 85, 89

(57) $\sqrt[3]{125 r^9 s^{12}} = \sqrt[3]{5^3 r^9 s^{12}} = \boxed{5 r^3 s^4}$

#s 59 - 72 Use quotient rule to divide. Then simplify, if possible.

(61) $\dfrac{\sqrt[3]{24}}{\sqrt[3]{3}} = \sqrt[3]{\dfrac{24}{3}} = \sqrt[3]{8} = 2$

(65) $\dfrac{\sqrt{x^5 y^3}}{\sqrt{xy}} = \sqrt{\dfrac{x^5 y^3}{xy}} = \sqrt{x^{5-1} y^{3-1}} = \sqrt{x^4 y^2}$

$= \boxed{x^2 y}$

(69) $\dfrac{3\sqrt{100 x^2}}{2\sqrt{2x^{-1}}} = \left(\dfrac{3}{2}\right)\sqrt{\dfrac{100 x^2}{2x^{-1}}} = \left(\dfrac{3}{2}\right)\sqrt{50 x^{2-(-1)}}$

$= \dfrac{3}{2}\sqrt{50 x^3} = \dfrac{3}{2}\sqrt{25 x^2 \cdot 2x} = \dfrac{3}{2} \cdot 5x\sqrt{2x}$

$= \boxed{\dfrac{15x}{2}\sqrt{2x}}$

099 §7.3 #s 73, 76, 81, 85, 89

#s 73 - 82 Find distance between each pair of points. Give an exact distance and a three-decimal-place approximation.

(73) $(5,1)$ & $(8,5)$

$$d = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

$$= \sqrt{(5-8)^2 + (1-5)^2}$$

$$= \sqrt{(-3)^2 + (-4)^2}$$

$$= \sqrt{9 + 16}$$

$$= \sqrt{25} = \boxed{5 \text{ units, is exact}}$$

$$\boxed{5.000 \text{ units}}$$

(76) $(3,-2), (-4,1)$

$$d = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

$$= \sqrt{(3-(-4))^2 + (-2-1)^2}$$

$$= \sqrt{7^2 + (-3)^2}$$

$$= \sqrt{49 + 9}$$

$$= \boxed{\sqrt{58}} \approx 7.615773106 \approx \boxed{7.616}$$

099 §7.3 #s 81, 85, 89

(81) $(1.7, -3.6)$ & $(-8.6, 5.7)$

$$d = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

$$= \sqrt{(1.7 - (-8.6))^2 + (-3.6 - 5.7)^2}$$

$$= \sqrt{(1.7 + 8.6)^2 + (-9.3)^2}$$

$$= \sqrt{(10.3)^2 + 86.49}$$

$$= \sqrt{106.09 + 86.49}$$

$$= \boxed{\sqrt{192.58}} \approx 13.87731963 \approx \boxed{13.877}$$

#s 83–94 Find the midpoint of the line segment between the given points.

(85) $(-2, -1), (-8, 6)$

$$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$

$$= \left(\frac{-2 - 8}{2}, \frac{-1 + 6}{2}\right)$$

$$= \left(\frac{-10}{2}, \frac{5}{2}\right)$$

$$= \boxed{\left(-5, \frac{5}{2}\right)}$$

(89) $\left(\frac{1}{2}, \frac{3}{8}\right), \left(-\frac{3}{2}, \frac{5}{8}\right)$

$$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$

$$= \left(\frac{\frac{1}{2} + -\frac{3}{2}}{2}, \frac{\frac{3}{8} + \frac{5}{8}}{2}\right)$$

$$= \left(\frac{-\frac{2}{2}}{2}, \frac{\frac{8}{8}}{2}\right)$$

$$= \boxed{\left(-\frac{1}{2}, \frac{1}{2}\right)}$$