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

(3) $\sqrt{3x}\sqrt{5y} = \sqrt{15xy}$

(5) $\sqrt{5}\sqrt{5} = \sqrt{25} = 5$

(7) $\sqrt{\frac{2}{3}}\sqrt{\frac{5}{7}} = \sqrt{\frac{2}{3} \cdot \frac{5}{7}} = \sqrt{\frac{10}{21}}$

(9) $\sqrt{0.1x}\sqrt{5y} = \sqrt{0.5xy}$

(11) $\sqrt{\frac{1}{5}a} \cdot \sqrt{\frac{1}{5}b} = \sqrt{\frac{1}{25}ab}$

$= \sqrt{\frac{1}{25}}\sqrt{ab}$

$= \frac{1}{5}\sqrt{ab}$

(13) $\sqrt{\frac{2x}{9}}\sqrt{\frac{9}{2}} = \sqrt{\frac{2x}{9} \cdot \frac{9}{2}}$

$= \sqrt{x}$

(15) $\sqrt{50} = \sqrt{25 \cdot 2}$

$= \sqrt{25} \cdot \sqrt{2}$

$= 5\sqrt{2}$

(17) $\sqrt{45} = \sqrt{9 \cdot 5}$

$= \sqrt{9}\sqrt{5}$

$= 3\sqrt{5}$

(19) $\sqrt{200} = \sqrt{100 \cdot 2}$

$= \sqrt{100}\sqrt{2}$

$= 10\sqrt{2}$

(21) $\sqrt{75x} = \sqrt{25 \cdot 3x}$

$= \sqrt{25}\sqrt{3x}$

$= 5\sqrt{3x}$

(23) $\sqrt{9x} = \sqrt{9}\sqrt{x}$

$= 3\sqrt{x}$

(25) $\sqrt{35} = \sqrt{7 \cdot 5}$

$= \sqrt{35}$ cannot be simplified

(27) $\sqrt{y^2} = y$

(29) $\sqrt{64x^2} = 8x$

(31) $\sqrt{11x^2} = \sqrt{11}\sqrt{x^2}$

$= \sqrt{11} \cdot x$

or

$x\sqrt{11}$

(33) $\sqrt{8x^2} = \sqrt{4x^2 \cdot 2}$

$= \sqrt{4x^2} \cdot \sqrt{2}$

$= 2x\sqrt{2}$

(35) $\sqrt{x^{20}} = \sqrt{(x^{10})^2}$

$= x^{10}$

(37) $\sqrt{25y^{10}} = \sqrt{5^2(y^5)^2}$

$= 5y^5$

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(39) $\sqrt{20x^6} = \sqrt{4(x^3)^2 \cdot 5}$

$= \sqrt{4(x^3)^2} \cdot \sqrt{5}$

$= \boxed{2x^3\sqrt{5}}$

(41) $\sqrt{72y^{100}} = \sqrt{36(y^{50})^2 \cdot 2}$

$= \sqrt{36(y^{50})^2} \cdot \sqrt{2}$

$= \boxed{6y^{50}\sqrt{2}}$

(43) $\sqrt{x^3} = \sqrt{x^2}\sqrt{x}$

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

(45) $\sqrt{x^7} = \sqrt{x^6 \cdot x}$

$= \sqrt{(x^3)^2}\sqrt{x}$

$= \boxed{x^3\sqrt{x}}$

(47) $\sqrt{y^{17}} = \sqrt{y^{16}}\sqrt{y}$

$= \sqrt{(y^8)^2}\sqrt{y}$

$= \boxed{y^8\sqrt{y}}$

(49) $\sqrt{25x^5} = \sqrt{25x^4 \cdot x}$

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

$= \boxed{5x^2\sqrt{x}}$

(51) $\sqrt{8x^{17}} = \sqrt{4 \cdot x^{16} \cdot 2x}$

$= \sqrt{(2x^8)^2 \cdot 2x}$

$= \boxed{2x^8\sqrt{2x}}$

(53) $\sqrt{90y^{19}} = \sqrt{9y^{18} \cdot 10y}$

$= \sqrt{(3y^9)^2 \cdot 10y}$

$= \sqrt{(3y^9)^2} \cdot \sqrt{10y}$

$= \boxed{3y^9\sqrt{10y}}$

(55) $\sqrt{3}\sqrt{15} = \sqrt{3 \cdot 15}$

$= \sqrt{3 \cdot 3 \cdot 5}$

$= \sqrt{3^2 \cdot 5}$

$= \sqrt{3^2}\sqrt{5}$

$= \boxed{3\sqrt{5}}$

(57) $\sqrt{5x}\sqrt{10y} = \sqrt{5x \cdot 10y}$

$= \sqrt{5^2 \cdot 2xy}$

$= \sqrt{5^2}\sqrt{2xy}$

$= \boxed{5\sqrt{2xy}}$

(59) $\sqrt{12x}\sqrt{3x} = \sqrt{6^2x^2}$

$= 6x$

(61) $\sqrt{15x^2}\sqrt{3x} = \sqrt{3^2x^2 \cdot 5x}$

$= \sqrt{3^2x^2}\sqrt{5x}$

$= \boxed{3x\sqrt{5x}}$

(63) $\sqrt{15x^4}\sqrt{5x^9} = \sqrt{5^2x^{12} \cdot 3x}$

$= \sqrt{(5x^6)^2}\sqrt{3x}$

$= \boxed{5x^6\sqrt{3x}}$

(65) $\sqrt{7x}\sqrt{3y} = \boxed{\sqrt{21xy}}$

(67) $\sqrt{50xy}\sqrt{4xy^2} = \sqrt{10^2x^2y^2 \cdot 2}$

$= \sqrt{(10xy)^2 \cdot 2}$

$= \sqrt{(10xy)^2} \cdot \sqrt{2}$

$= 10xy\sqrt{2}$

(69) $\sqrt{\frac{49}{16}} = \frac{\sqrt{7^2}}{\sqrt{4^2}}$

$= \boxed{\frac{7}{4}}$

(71) $\sqrt{\frac{3}{4}} = \frac{\sqrt{3}}{\sqrt{2^2}}$

$= \boxed{\frac{\sqrt{3}}{2}}$

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(73) $\sqrt{\frac{x^2}{36}} = \frac{\sqrt{x^2}}{\sqrt{6^2}}$

$= \boxed{\frac{x}{6}}$

(75) $\sqrt{\frac{7}{x^4}} = \frac{\sqrt{7}}{\sqrt{(x^2)^2}}$

$= \boxed{\frac{\sqrt{7}}{x^2}}$

(77) $\sqrt{\frac{72}{y^{20}}} = \frac{\sqrt{6^2 \cdot 2}}{\sqrt{(y^{10})^2}}$

$= \frac{\sqrt{6^2}\sqrt{2}}{y^{10}}$

$= \boxed{\frac{6\sqrt{2}}{y^{10}}}$

(79) $\frac{\sqrt{54}}{\sqrt{6}} = \sqrt{\frac{54}{6}}$

$= \sqrt{9}$

$= \sqrt{3^2}$

$= \boxed{3}$

(81) $\frac{\sqrt{24}}{\sqrt{3}} = \sqrt{\frac{24}{3}}$

$= \sqrt{8}$

$= \sqrt{2^2 \cdot 2}$

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

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

(83) $\frac{\sqrt{75}}{\sqrt{15}} = \sqrt{\frac{75}{15}}$

$= \boxed{\sqrt{5}}$

(85) $\frac{\sqrt{48x}}{\sqrt{3x}} = \sqrt{\frac{48x}{3x}}$

$= \sqrt{16}$

$= \sqrt{4^2}$

$= \boxed{4}$

(87) $\frac{\sqrt{32x^3}}{\sqrt{8x}} = \sqrt{\frac{32x^3}{8x}}$

$= \sqrt{4x^2}$

$= \sqrt{(2x)^2}$

$= \boxed{2x}$

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(89) $\frac{\sqrt{150x^4}}{\sqrt{3x}} = \sqrt{\frac{150x^4}{3x}}$

$= \sqrt{50x^3}$

$= \sqrt{25x^2 \cdot 2x}$

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

$= \boxed{5x\sqrt{2x}}$

(91) $\frac{\sqrt{400x^{10}}}{\sqrt{10x^3}} = \sqrt{\frac{400x^{10}}{10x^3}}$

$= \sqrt{40x^7}$

$= \sqrt{2^2 x^6 \cdot 10x}$

$= \sqrt{(2x^3)^2 \cdot 10x}$

$= \boxed{2x^3\sqrt{10x}}$

(93) $\sqrt[3]{16} = \sqrt[3]{2^3}$

$= \boxed{2}$

(95) $\sqrt[3]{54} = \sqrt[3]{27 \cdot 2}$

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

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

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

(97) $\sqrt[4]{32} = \sqrt[4]{2^4}$

$= \boxed{2}$

(99) $\sqrt[3]{4}\sqrt[3]{2} = \sqrt[3]{4 \cdot 2}$

$= \sqrt[3]{8}$

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

$= \boxed{2}$

(101) $\sqrt[3]{9}\sqrt[3]{6} = \sqrt[3]{3^3 \cdot 2}$

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

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

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(103) $\sqrt[4]{4}\sqrt[4]{8} = \sqrt[4]{2^2 \cdot 2^3}$

$= \sqrt[4]{2^4 \cdot 2}$

$= \boxed{2\sqrt[4]{2}}$

(105) $\sqrt[3]{\frac{27}{8}} = \frac{\sqrt[3]{27}}{\sqrt[3]{8}}$

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

$= \boxed{\frac{3}{2}}$

(107) $\sqrt[3]{\frac{3}{8}} = \frac{\sqrt[3]{3}}{\sqrt[3]{8}}$

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

$= \boxed{\frac{\sqrt[3]{3}}{2}}$

(109) $\sqrt{90(x+4)^3} = \sqrt{9(x+4)^2 \cdot 10(x+4)}$

$= \boxed{3(x+4)\sqrt{10(x+4)}}$

(111) $\sqrt{x^2-6x+9} = \sqrt{(x-3)^2}$

$= \boxed{x-3}$

(113) $\sqrt{2^{43} x^{104} y^{13}}$

$= \sqrt{2^{42} x^{104} y^{12} \cdot 2y}$

$= \boxed{2^{21} x^{52} y^6 \sqrt{2y}}$

(115) $\sqrt[3]{24x^5}$

$= \sqrt[3]{8x^3 \cdot 3x^2}$

$= \sqrt[3]{(2x)^3 \cdot 3x^2}$

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