

$$\sqrt{54} = \sqrt{9 \times 6} = \sqrt{9} \times \sqrt{6}$$

$$= 3\sqrt{3} \times \sqrt{2}$$

$$= 3\sqrt{6} \checkmark$$

$$2\sqrt{32} = 2\sqrt{8} \times \sqrt{4}$$

$$= 2\sqrt{8} \times 2$$

$$= 4\sqrt{8}$$

$$\sqrt{2} \neq 2$$

$$\text{but } \sqrt{4} = 2 \checkmark$$

$$= 4 \times 2\sqrt{2}$$

$$= 8\sqrt{2}$$

$$\frac{\sqrt{28}}{6} = \sqrt{\frac{28}{6}} \times$$

$$6 = \sqrt{6} \times$$

$$\text{if } \frac{\sqrt{28}}{\sqrt{6}} = \sqrt{\frac{28}{6}} \checkmark$$

$$\text{so, } \frac{\sqrt{28}}{6} = \frac{\sqrt{7} \times \sqrt{4}}{6} = \frac{\sqrt{7} \times 2}{6}$$

$$= \frac{\sqrt{7}}{3}$$

$$\frac{\sqrt{\frac{12}{25}}}{\sqrt{25}} = \frac{\sqrt{12}}{\sqrt{25}} = \frac{\sqrt{4 \times 3}}{5}$$

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

$$\sqrt{12} = \sqrt{4 \times 3}$$

$$= 2\sqrt{3}$$

4, 9, 16, 25, ...
2, 3, 4, 5, ...

$$\sqrt{4} = 2$$

$$2 \times 2 = 4$$

$$2^2 = 4$$

$$2 = \sqrt{4}$$

$$\sqrt{4} = 2 \checkmark$$

$$\sqrt{9} = 3$$

Q2)

$$7\sqrt{2} - 3\sqrt{2}$$

$$= 4\sqrt{2}$$

$$9\sqrt{3} + 3\sqrt{6} - 6\sqrt{3} + 2\sqrt{6}$$

$$= 3\sqrt{3} + 5\sqrt{6} \checkmark$$

$$8\sqrt{5} - \sqrt{20}$$

$$8\sqrt{5} - \sqrt{4 \times 5}$$

$$8\sqrt{5} - 2\sqrt{5}$$

$$= 6\sqrt{5} \checkmark$$

$$5\sqrt{12} + 4\sqrt{27} - 3\sqrt{75}$$

$$= 5\sqrt{4 \times 3} + 4\sqrt{9 \times 3} - 3\sqrt{25 \times 3}$$

$$= 5 \times 2\sqrt{3} + 4 \times 3\sqrt{3} - 3 \times 5\sqrt{3}$$

$$= 10\sqrt{3} + 12\sqrt{3} - 15\sqrt{3}$$

$$= 22\sqrt{3} - 15\sqrt{3} = 7\sqrt{3}$$

Q3)

$$\sqrt{6} \times \sqrt{7}$$

$$= \sqrt{3 \times 2 \times 7}$$

$$= 3\sqrt{2 \times 7} \times$$

$$\begin{matrix} 6 & 7 \\ \swarrow & \searrow \\ 3 & 2 \end{matrix} \quad \begin{matrix} 7 & 7 \\ \swarrow & \searrow \\ 7 & 1 \end{matrix}$$

$$\approx 4, 9, 16, 25, \dots$$

$$\sqrt{6} \times \sqrt{7} = \sqrt{42}$$

$$4? 9? 16? \times$$

$$\sqrt{4} = 2$$

$$2^2 = 4$$

$$\sqrt{15} \div \sqrt{3}$$

$$\sqrt{\frac{15}{3}} = \sqrt{5} \checkmark$$

$$3\sqrt{5} \times \sqrt{10}$$

$$= -$$

$$\begin{matrix} \sqrt{5} & \sqrt{10} \\ \swarrow & \searrow \\ 5 & 2 \end{matrix}$$

$$= 3\sqrt{50}$$

$$= 3\sqrt{25 \times 2}$$

$$= 3 \times 5\sqrt{2} = 15\sqrt{2} \checkmark$$

$$\frac{18\sqrt{12}}{6\sqrt{2}} = \frac{3\sqrt{12}}{\sqrt{2}}$$

$$\frac{3\sqrt{12}}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}}$$

$$= \frac{3\sqrt{24}}{2} = \frac{3\sqrt{8 \times 3}}{2}$$

$$= \frac{3\sqrt{4 \times 2 \times 3}}{2}$$

$$= \frac{3 \times 2\sqrt{6}}{2}$$

$$= 3\sqrt{6}$$

$$3\sqrt{\frac{12}{2}} = 3\sqrt{6}$$

$$\sqrt{2} (3\sqrt{5} + \sqrt{10})$$

$$= \sqrt{2} \times 3\sqrt{5} + \sqrt{2} \times \sqrt{10}$$

$$= 3\sqrt{10} + \sqrt{20}$$

$$= 3\sqrt{10} + \sqrt{4 \times 5}$$

$$= 3\sqrt{10} + 2\sqrt{5} \checkmark$$

$$= 3\sqrt{5 \times 2} + 2\sqrt{5}$$

$$= 3\sqrt{2} \times \sqrt{5} + 2\sqrt{5}$$

$$= \sqrt{5} (3\sqrt{2} + 2)$$

$$2\sqrt{6} (4\sqrt{3} - 3\sqrt{6})$$

$$= 8\sqrt{18} - 6\sqrt{36}$$

$$= 8\sqrt{9 \times 2} - 6 \times 6$$

$$= 24\sqrt{2} - 36 \checkmark \checkmark \checkmark$$

Notes:
-SQRT(4) = 2, SQRT(2) /= 2
-Make sure to copy the Q down (whether it be a sqrt or a +/-).
-Make SQRT(12) 4*3, not 6*2

$$6) (\sqrt{7} - 3)(4 + \sqrt{7})$$

$$2) (4\sqrt{5} - 1)(2\sqrt{5} + 3)$$

$$2) (4 + \sqrt{11})^2$$

$$6) (6 - \sqrt{3})(6 + \sqrt{3})$$