Radical Review Man.....don't have a cow!!!

Simplify, rationalize, add fractions, multiply, etc. as indicated:

1. $3\sqrt{50}$

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

$= [5]3\sqrt{2}$

$= 15\sqrt{2}$

2. $2\sqrt{3} - 5\sqrt{3}$

$= -3\sqrt{3}$

3. $\sqrt{12} + \sqrt{27}$

$= \sqrt{2 \cdot 2 \cdot 3} + \sqrt{3 \cdot 3 \cdot 3}$

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

$= 5\sqrt{3}$

4. $\dfrac{\sqrt{3}}{2} - \dfrac{\sqrt{3}}{4}$

$= \dfrac{[2]\sqrt{3}}{[2]2} - \dfrac{\sqrt{3}}{2 \cdot 2}$

$= \dfrac{2\sqrt{3}}{4} - \dfrac{\sqrt{3}}{4}$

$= \dfrac{\left(2\sqrt{3}\right) - \left(\sqrt{3}\right)}{4}$

$= \dfrac{2\sqrt{3} - \sqrt{3}}{4}$

$= \dfrac{\sqrt{3}}{4}$

5. $\dfrac{\sqrt{3}}{2} + \dfrac{\sqrt{2}}{3}$

$= \dfrac{[3]\sqrt{3}}{[3]2} + \dfrac{[2]\sqrt{2}}{[2]3}$

$= \dfrac{3\sqrt{3}}{6} + \dfrac{2\sqrt{2}}{6}$

$= \dfrac{\left(3\sqrt{3}\right) + \left(2\sqrt{2}\right)}{6}$

$= \dfrac{3\sqrt{3} + 2\sqrt{2}}{6}$

6. $\dfrac{1}{\sqrt{2}}$

$= \dfrac{1}{\sqrt{2}} \times \dfrac{\sqrt{2}}{\sqrt{2}}$

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

$= \dfrac{\sqrt{2}}{2}$

7. $\left(2\sqrt{3}\right)\left(-4\sqrt{5}\right)$

$= -8\sqrt{15}$

8. $\left(2 + \sqrt{3}\right)\left(4 + 3\sqrt{3}\right)$

$= 8 + 6\sqrt{3} + 4\sqrt{3} + \sqrt{9}$

$= 8 + 6\sqrt{3} + 4\sqrt{3} + 3$

$= 11 + 10\sqrt{3}$

9. $\dfrac{1}{\sqrt{2}} - \dfrac{3}{2\sqrt{3}}$

$= \dfrac{1}{\sqrt{2}} \times \dfrac{\sqrt{2}}{\sqrt{2}} - \dfrac{3}{2\sqrt{3}} \times \dfrac{\sqrt{3}}{\sqrt{3}}$

$= \dfrac{\sqrt{2}}{\sqrt{4}} - \dfrac{3\sqrt{3}}{2\sqrt{9}}$

$= \dfrac{\sqrt{2}}{2} - \dfrac{3\sqrt{3}}{6}$

$= \dfrac{\sqrt{2}}{2} - \dfrac{3\sqrt{3}}{2 \cdot 3}$

$= \dfrac{\sqrt{2}}{2} - \dfrac{\sqrt{3}}{2}$

$= \dfrac{\left(\sqrt{2}\right) - \left(\sqrt{3}\right)}{2}$

$= \dfrac{\sqrt{2} - \sqrt{3}}{2}$

10. $\dfrac{1}{3} \times \dfrac{3}{4}$

$= \dfrac{1}{3} \times \dfrac{3}{4}$

$= \dfrac{1}{4}$

11. $\dfrac{2}{3} \div \dfrac{4}{3}$

$= \dfrac{2}{3} \times \dfrac{3}{4}$

$= \dfrac{2}{3} \times \dfrac{3}{2 \cdot 2}$

$= \dfrac{1}{2}$

12. $\dfrac{\frac{2}{3}}{\frac{3}{5}}$

$= \dfrac{2}{3} \div \dfrac{3}{5}$

$= \dfrac{2}{3} \times \dfrac{5}{3}$

$= \dfrac{10}{9}$

13.

$$\frac{\frac{1}{2}}{\frac{1}{4}} + \frac{\frac{1}{3}}{\frac{1}{9}}$$

$$= \frac{1}{2} \div \frac{1}{4} + \frac{1}{3} \div \frac{1}{9}$$

$$= \frac{1}{2} \times \frac{4}{1} + \frac{1}{3} \times \frac{9}{1}$$

$$= \frac{1}{2} \times \frac{2 \cdot 2}{1} + \frac{1}{3} \times \frac{3 \cdot 3}{1}$$

$$= \frac{2}{1} + \frac{3}{1}$$

$$= 2 + 3$$

$$= 5$$

14.

$$\frac{\frac{\sqrt{2}}{2}}{\frac{\sqrt{3}}{2}} + \frac{\frac{\sqrt{2}}{2}}{\frac{1}{2}}$$

$$= \frac{\sqrt{2}}{2} \div \frac{\sqrt{3}}{2} + \frac{\sqrt{2}}{2} \div \frac{1}{2}$$

$$= \frac{\sqrt{2}}{2} \times \frac{2}{\sqrt{3}} + \frac{\sqrt{2}}{2} \times \frac{2}{1}$$

$$= \frac{\sqrt{2}}{\sqrt{3}} + \frac{\sqrt{2}}{1}$$

$$= \frac{\sqrt{2}}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} + \frac{\sqrt{2}}{1}$$

$$= \frac{\sqrt{6}}{\sqrt{9}} + \frac{\sqrt{2}}{1}$$

$$= \frac{\sqrt{6}}{3} + \frac{\sqrt{2}}{1}$$

$$= \frac{\sqrt{6}}{3} + \frac{[3]\sqrt{2}}{1[3]}$$

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

$$= \frac{\left(\sqrt{6}\right) + \left(3\sqrt{2}\right)}{3}$$

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