

Quiz 2: Add, Subtract, Multiply and Simplify Radicals.

1. Simplify each (5 marks).

$$a) 5\sqrt{2} + 7\sqrt{11} + 2\sqrt{2} - 3\sqrt{11} = 7\sqrt{2} + 4\sqrt{11}$$

$$\begin{aligned} b) \sqrt{24} + \sqrt{150} - \sqrt{54} &= \sqrt{4}\sqrt{6} + \sqrt{25}\sqrt{6} - \sqrt{9}\sqrt{6} \\ &= 2\sqrt{6} + 5\sqrt{6} - 3\sqrt{6} \\ &= 4\sqrt{6} \end{aligned}$$

$$\begin{aligned} c) 5\sqrt{12} + 7\sqrt{20} + 2\sqrt{75} - 3\sqrt{45} &= 5\sqrt{4}\sqrt{3} + 7\sqrt{4}\sqrt{5} + 3\sqrt{9}\sqrt{5} \\ &= 5(2)\sqrt{3} + 7(2)\sqrt{5} + 3(3)\sqrt{5} \\ &= 10\sqrt{3} + 14\sqrt{5} + 9\sqrt{5} \\ &= 10\sqrt{3} + 23\sqrt{5} \end{aligned}$$

2. Multiply each, always express in simplest form. (5 marks)

$$a) 5\sqrt{3} \times 2\sqrt{7} = 10\sqrt{21}$$

$$\begin{aligned} b) \sqrt{8} \times \sqrt{6} &= \sqrt{48} = \sqrt{16}\sqrt{3} \\ &= 4\sqrt{3} \end{aligned}$$

$$\begin{aligned} c) 3\sqrt{6} \times 4\sqrt{3} &= 12\sqrt{18} \\ &= 12\sqrt{9}\sqrt{2} \\ &= 12(3)\sqrt{2} \\ &= 36\sqrt{2} \end{aligned}$$

3. Multiply each, always express in simplest form. (5 marks)

a) $2\sqrt{3}(2\sqrt{8} + 5\sqrt{3})$

$$= 4\sqrt{24} + 10\sqrt{9}$$

$$= 4\sqrt{4\sqrt{6}} + 10(3)$$

$$= 4(2)\sqrt{6} + 30$$

$$= 8\sqrt{6} + 30$$

b) $(\cancel{3\sqrt{6}} - 2\sqrt{5})^2 = (3\sqrt{6} - 5\sqrt{2})(3\sqrt{6} - 5\sqrt{2})$

$$= 9\sqrt{36} - 15\sqrt{12} - 15\sqrt{12} + 25\sqrt{4}$$

$$= 9(6) - 30\sqrt{12} + 25(2)$$

$$= 54 - 30\sqrt{4\sqrt{3}} + 50$$

$$= 104 - 30(2)\sqrt{3}$$

$$= 104 - 60\sqrt{3}$$

4. Express the mixed radical as an entire radical. (2 marks)

$5\sqrt{3}$ ~~$5\sqrt{3}$~~

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

$$= \sqrt{75}$$