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Problem solving : Set A

Bronze:

a) $\sqrt{147} - \sqrt{75}$

$7\sqrt{3} - 5\sqrt{3}$

$= 2\sqrt{3}$

b) $\frac{24\sqrt{2}}{\sqrt{147} - \sqrt{75}} = \frac{24\sqrt{2}}{2\sqrt{3}} = 12 \times \frac{\sqrt{2}}{\sqrt{3}} = \frac{\sqrt{2} \times \sqrt{3}}{3}$

$= 4\sqrt{6}$

Silver

a) $(11 + \sqrt{5})(\sqrt{5} + 1)$

$(11 + \sqrt{5})(\sqrt{5} + 1) = 11\sqrt{5} + 11 + \sqrt{5} \times \sqrt{5} + \sqrt{5} \times 1$

$= 11 + 11\sqrt{5} + 5 + \sqrt{5} = 16 + 12\sqrt{5}$

$= 16 + 12\sqrt{5}$

b) $\frac{(11 + \sqrt{5})(\sqrt{5} + 1)}{(\sqrt{5} - 1)(\sqrt{5} + 1)}$

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

$= 16 + 12\sqrt{5}$

$= \frac{16 + 12\sqrt{5}}{4} = \frac{16}{4} + \frac{12\sqrt{5}}{4} = 4 + 3\sqrt{5}$

$= 4 + 3\sqrt{5}$

Gold:

$\frac{(6\sqrt{3} - 4)(5 + \sqrt{3})}{(5 - \sqrt{3})(5 + \sqrt{3})} = \frac{13}{11}\sqrt{3} - \frac{1}{11}$

$p = 13/11 \quad q = -1/11$