1.3

1) $5\sqrt{2} - \frac{1}{2}\sqrt{2} + \frac{2}{3}\sqrt{2} - 2\sqrt{2} = \left(5 - \frac{1}{2} + \frac{2}{3} - 2\right)\sqrt{2}$
$= \left(\frac{30}{6} - \frac{3}{6} + \frac{4}{6} - \frac{12}{6}\right)\sqrt{2}$
$= \frac{19}{6}\sqrt{2}$

2) $\sqrt{50} - 2\sqrt{8} + 3\sqrt{18} - 7\sqrt{2} = 5\sqrt{2} - 2 \cdot 2\sqrt{2} + 3 \cdot 3\sqrt{2} - 7\sqrt{2}$
$= 5\sqrt{2} - 4\sqrt{2} + 9\sqrt{2} - 7\sqrt{2}$
$= (5 - 4 + 9 - 7)\sqrt{2}$
$= 3\sqrt{2}$

3) $2\sqrt{54} - 2\sqrt{24} - \sqrt{150} + \sqrt{6} = 2 \cdot 3\sqrt{6} - 2 \cdot 2\sqrt{6} - 5\sqrt{6} + \sqrt{6}$
$= 6\sqrt{6} - 4\sqrt{6} - 5\sqrt{6} + \sqrt{6}$
$= (6 - 4 - 5 + 1)\sqrt{6}$
$= -2\sqrt{6}$

4) $\sqrt{36} + 3\sqrt{6} - 5\sqrt{144} = 6 + 3\sqrt{6} - 5 \cdot 12$
$= 6 + 3\sqrt{6} - 60$
$= -54 + 3\sqrt{6}$

5) $2\sqrt{\frac{1}{2}} - \sqrt{18} + \sqrt{\frac{2}{9}} - \sqrt{\frac{9}{8}} = 2\frac{\sqrt{1}}{\sqrt{2}} - 3\sqrt{2} + \frac{\sqrt{2}}{\sqrt{9}} - \frac{\sqrt{9}}{\sqrt{8}}$
$= \frac{2}{\sqrt{2}} - 3\sqrt{2} + \frac{\sqrt{2}}{3} - \frac{3}{2\sqrt{2}}$
$= \frac{2\sqrt{2}}{2} - 3\sqrt{2} + \frac{\sqrt{2}}{3} - \frac{3\sqrt{2}}{2 \cdot 2}$
$= \sqrt{2} - 3\sqrt{2} + \frac{1}{3}\sqrt{2} - \frac{3}{4}\sqrt{2}$
$= \left(1 - 3 + \frac{1}{3} - \frac{3}{4}\right)\sqrt{2}$
$= \left(\frac{12}{12} - \frac{36}{12} + \frac{4}{12} - \frac{9}{12}\right)\sqrt{2}$
$= -\frac{29}{12}\sqrt{2}$

6) $\sqrt{48} - \sqrt{\frac{12}{25}} + \sqrt{\frac{1}{3}} + 3\sqrt{75} = 4\sqrt{3} - \frac{\sqrt{12}}{\sqrt{25}} + \frac{\sqrt{1}}{\sqrt{3}} + 3 \cdot 5\sqrt{3}$
$= 4\sqrt{3} - \frac{2\sqrt{3}}{5} + \frac{1}{\sqrt{3}} + 15\sqrt{3}$
$= 4\sqrt{3} - \frac{2}{5}\sqrt{3} + \frac{1}{3}\sqrt{3} + 15\sqrt{3}$
$= \left(4 - \frac{2}{5} + \frac{1}{3} + 15\right)\sqrt{3}$
$= \left(\frac{60}{15} - \frac{6}{15} + \frac{5}{15} + \frac{225}{15}\right)\sqrt{3}$

$$= \tfrac{284}{15}\sqrt{3}$$

7) $2\sqrt{28} - 6\sqrt{\frac{7}{4}} + 14\sqrt{\frac{1}{7}} = 2 \cdot 2\sqrt{7} - 6 \cdot \frac{\sqrt{7}}{\sqrt{4}} + 14 \cdot \frac{\sqrt{1}}{\sqrt{7}}$

$$= 4\sqrt{7} - \frac{6\sqrt{7}}{2} + \frac{14}{\sqrt{7}}$$

$$= 4\sqrt{7} - 3\sqrt{7} + \frac{14\sqrt{7}}{7}$$

$$= 4\sqrt{7} - 3\sqrt{7} + 2\sqrt{7}$$

$$= (4 - 3 + 2)\sqrt{7}$$

$$= 3\sqrt{7}$$

8) $\sqrt{72} + 3 - \sqrt{50} - \sqrt{25} = 6\sqrt{2} + 3 - 5\sqrt{2} - 5$

$$= (3 - 5) + (6 - 5)\sqrt{2}$$

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

9) $5\sqrt{12} - 2\sqrt{\frac{3}{4}} + 2\sqrt{27} - 8\sqrt{\frac{3}{16}} = 5 \cdot 2\sqrt{3} - 2 \cdot \frac{\sqrt{3}}{\sqrt{4}} + 2 \cdot 3\sqrt{3} - 8 \cdot \frac{\sqrt{3}}{\sqrt{16}}$

$$= 10\sqrt{3} - 2 \cdot \frac{\sqrt{3}}{2} + 6\sqrt{3} - 8 \cdot \frac{\sqrt{3}}{4}$$

$$= 10\sqrt{3} - \sqrt{3} + 6\sqrt{3} - 2\sqrt{3}$$

$$= (10 - 1 + 6 - 2)\sqrt{3}$$

$$= 13\sqrt{3}$$

10) $-\sqrt{\frac{3}{5}} + 2\sqrt{\frac{5}{3}} - \sqrt{60} + \sqrt{\frac{1}{15}} = -\frac{\sqrt{3}}{\sqrt{5}} + 2 \cdot \frac{\sqrt{5}}{\sqrt{3}} - 2\sqrt{15} + \frac{\sqrt{1}}{\sqrt{15}}$

$$= -\frac{\sqrt{3}\sqrt{5}}{5} + \frac{2\sqrt{5}\sqrt{3}}{3} - 2\sqrt{15} + \frac{1\sqrt{15}}{15}$$

$$= -\tfrac{1}{5}\sqrt{15} + \tfrac{2}{3}\sqrt{15} - 2\sqrt{15} + \tfrac{1}{15}\sqrt{15}$$

$$= \left(-\tfrac{1}{5} + \tfrac{2}{3} - 2 + \tfrac{1}{15}\right)\sqrt{15}$$

$$= \left(-\tfrac{3}{15} + \tfrac{10}{15} - \tfrac{30}{15} + \tfrac{1}{15}\right)\sqrt{15}$$

$$= -\tfrac{22}{15}\sqrt{15}$$