Solutions

1. Express each of these as mixed radicals in simplest form.

a) $\sqrt{27}$

$= \sqrt{9 \times 3}$

$= \sqrt{9} \times \sqrt{3}$

$= 3\sqrt{3}$

b) $\sqrt{50}$

$= \sqrt{25 \times 2}$

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

$= 5\sqrt{2}$

c) $\sqrt{98}$

$= \sqrt{49 \times 2}$

$= \sqrt{49} \times \sqrt{2}$

$= 7\sqrt{2}$

d) $\sqrt{32}$

$= \sqrt{16 \times 2}$

$= \sqrt{16} \times \sqrt{2}$

$= 4\sqrt{2}$

4. Express as a mixed radical in simplest form.

a) $3\sqrt{12}$

$= 3\sqrt{4\times3}$

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

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

$= 6\sqrt{3}$

c) $10\sqrt{40}$

$= 10\sqrt{4\times10}$

$= 10\sqrt{4}\times\sqrt{10}$

$= (10)(2)\sqrt{10}$

$= 20\sqrt{10}$

e) $\frac{2}{3}\sqrt{45}$

$= \frac{2}{3}\sqrt{9\times5}$

$= \frac{2}{3}\sqrt{9}\times\sqrt{5}$

$= \left(\frac{2}{3}\right)(3)\sqrt{5}$

$= 2\sqrt{5}$

b) $-5\sqrt{125}$

$= -5\sqrt{25\times5}$

$= -5\sqrt{25}\times\sqrt{5}$

$= (-5)(5)\sqrt{5}$

$= -25\sqrt{5}$

d) $-\frac{1}{2}\sqrt{60}$

$= -\frac{1}{2}\sqrt{4\times15}$

$= -\frac{1}{2}\sqrt{4}\times\sqrt{15}$

$= \left(-\frac{1}{2}\right)(2)\sqrt{15}$

$= -\sqrt{15}$

f) $-\frac{9}{10}\sqrt{1200}$

$= -\frac{9}{10}\sqrt{400\times3}$

$= -\frac{9}{10}\sqrt{400}\times\sqrt{3}$

$= \left(-\frac{9}{10}\right)(20)\sqrt{3}$

$= -18\sqrt{3}$

6. Simplify.

a) $\sqrt{8} - \sqrt{32}$

b) $\sqrt{12} + \sqrt{18} - \sqrt{27} + \sqrt{50}$

c) $3\sqrt{98} - 5\sqrt{72}$

a) $\sqrt{8} - \sqrt{32}$

$= \sqrt{4\times2} - \sqrt{16\times2}$

$= \sqrt{4}\times\sqrt{2} - \sqrt{16}\times\sqrt{2}$

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

c) $3\sqrt{98} - 5\sqrt{72}$

$= 3\sqrt{49\times2} - 5\sqrt{36\times2}$

$= 3\sqrt{49}\times\sqrt{2} - 5\sqrt{36}\times\sqrt{2}$

$= (3)(7)\sqrt{2} - (5)(6)\sqrt{2}$

$= 21\sqrt{2} - 30\sqrt{2}$

b) $\sqrt{12} + \sqrt{18} - \sqrt{27} + \sqrt{50}$

$= \sqrt{4\times3} + \sqrt{9\times2} - \sqrt{9\times3} + \sqrt{25\times2}$

$= \sqrt{4}\times\sqrt{3} + \sqrt{9}\times\sqrt{2} - \sqrt{9}\times\sqrt{3} + \sqrt{25}\times\sqrt{2}$

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

d) $-4\sqrt{200} + 5\sqrt{242}$

e) $-5\sqrt{45} + \sqrt{52} + 3\sqrt{125}$

f) $7\sqrt{12} - 3\sqrt{28} + \frac{1}{2}\sqrt{48} + \frac{2}{3}\sqrt{63}$

d) $-4\sqrt{200} + 5\sqrt{242}$

$= -4\sqrt{100 \times 2} + 5\sqrt{121 \times 2}$

$= -4\sqrt{100} \times \sqrt{2} + 5\sqrt{121} \times \sqrt{2}$

$= (-4)(10)\sqrt{2} + (5)(11)\sqrt{2}$

$= -40\sqrt{2} + 55\sqrt{2}$

e) $-5\sqrt{45} + \sqrt{52} + 3\sqrt{125}$

$= -5\sqrt{9 \times 5} + \sqrt{4 \times 13} + 3\sqrt{25 \times 5}$

$= -5\sqrt{9}\sqrt{5} + \sqrt{4}\sqrt{13} + 3\sqrt{25}\sqrt{5}$

$= -5(3)\sqrt{5} + 2\sqrt{13} + 3(5)\sqrt{5}$

$= -15\sqrt{5} + 2\sqrt{13} + 15\sqrt{5}$

f) $7\sqrt{12} - 3\sqrt{28} + \frac{1}{2}\sqrt{48} + \frac{2}{3}\sqrt{63}$

$= 7\sqrt{4 \times 3} - 3\sqrt{4 \times 7} + \frac{1}{2}\sqrt{16 \times 3} + \frac{2}{3}\sqrt{9 \times 7}$

$= 7\sqrt{4}\sqrt{3} - 3\sqrt{4}\sqrt{7} + \frac{1}{2}\sqrt{16}\sqrt{3} + \frac{2}{3}\sqrt{9}\sqrt{7}$

$= 14\sqrt{3} - 6\sqrt{7} + 2\sqrt{3} + 2\sqrt{7}$

Attachments

Simplifying Radicals Video 1.swf

Simplifying Radicals video.swf