Solutions

2. Simplify.

a) $\sqrt{5} \times \sqrt{7}$

$= \sqrt{5 \times 7}$

$= \sqrt{35}$

c) $2\sqrt{3} \times 5\sqrt{2}$

$= (2)(5) \times \sqrt{3 \times 2}$

$= 10\sqrt{6}$

b) $\sqrt{11} \times \sqrt{6}$

$= \sqrt{11 \times 6}$

$= \sqrt{66}$

d) $-4\sqrt{3} \times 8\sqrt{13}$

$= (-4)(8) \times \sqrt{3 \times 13}$

$= -32\sqrt{39}$

3. Simplify.

a) $4\sqrt{5} + 3\sqrt{5}$

$$= 7\sqrt{5}$$

b) $9\sqrt{7} - 4\sqrt{7}$

$$= 5\sqrt{7}$$

c) $3\sqrt{3} + 8\sqrt{2} - 4\sqrt{3} + 11\sqrt{2}$

$$= -\sqrt{3} + 19\sqrt{2}$$

d) $\sqrt{8} - \sqrt{18}$

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

5. Simplify.

a) $\sqrt{3}(2 - \sqrt{5})$

$$= 2\sqrt{3} - \sqrt{3}\sqrt{5}$$
$$= 2\sqrt{3} - \sqrt{15}$$

b) $2\sqrt{2}(\sqrt{7} + 3\sqrt{3})$

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

c) $(4\sqrt{2})^2$

$$= (4\sqrt{2})(4\sqrt{2})$$
$$= 16\sqrt{2}\sqrt{2}$$
$$= 16\sqrt{4}$$
$$= 32$$

d) $(-2\sqrt{3})^3$

$$= (-2)^3(\sqrt{3})^3$$
$$= -8(\sqrt{3}\sqrt{3}\sqrt{3})$$
$$= -8(3)(\sqrt{3}) \quad = -24\sqrt{3}$$

e) $4\sqrt{3} \times 3\sqrt{6}$

$$= 12\sqrt{3}\sqrt{6}$$
$$= 12\sqrt{18}$$
$$= 12\sqrt{9}\sqrt{2} \quad = 36\sqrt{2}$$

f) $-7\sqrt{2} \times 5\sqrt{8}$

$$= -35\sqrt{2}\sqrt{8}$$
$$= -35\sqrt{2}\sqrt{4 \times 2}$$
$$= -35\sqrt{2}\sqrt{4}\sqrt{2}$$
$$= -35(2)(2) \quad = -140$$

6. Simplify.

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

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

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

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

     $= -2\sqrt{2}$

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

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

     $= -\sqrt{3} + 8\sqrt{2}$

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

     $= -9\sqrt{2}$

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

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

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

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

     $= 15\sqrt{2}$

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

     $= 2\sqrt{13}$

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

     $= 16\sqrt{3} - 4\sqrt{7}$

7. Simplify.

K a) $(6 - \sqrt{5})(3 + 2\sqrt{10})$
  b) $(2 + 3\sqrt{3})^2$
  c) $(\sqrt{2} + \sqrt{5})(\sqrt{2} - \sqrt{5})$

a)

	6	$-\sqrt{5}$
3	18	$-3\sqrt{5}$
$2\sqrt{10}$	$12\sqrt{10}$	$-2\sqrt{50}$

$= 18 - 3\sqrt{5} + 12\sqrt{10} - 2\sqrt{50}$
$= 18 - 3\sqrt{5} + 12\sqrt{10} - 10\sqrt{2}$

b)

	2	$3\sqrt{3}$
2	4	$6\sqrt{3}$
$3\sqrt{3}$	$6\sqrt{3}$	$9\sqrt{3}\sqrt{3}$

$= 4 + 12\sqrt{3} + 27$
$= 31 + 12\sqrt{3}$

c)

	$\sqrt{2}$	$\sqrt{5}$
$\sqrt{2}$	$\sqrt{4}$	$\sqrt{10}$
$-\sqrt{5}$	$-\sqrt{10}$	$-\sqrt{25}$

$= 2 - 5$
$= -3$

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d) $(3\sqrt{3} + 4\sqrt{2})(\sqrt{3} - 2\sqrt{2})$
e) $(2\sqrt{5} - 3\sqrt{7})^2$
f) $(1 - \sqrt{3})(2 + \sqrt{6})(5 + \sqrt{2})$

d)

	$3\sqrt{3}$	$4\sqrt{2}$
$\sqrt{3}$	$3\sqrt{9}$	$4\sqrt{6}$
$-2\sqrt{2}$	$-6\sqrt{6}$	$-8\sqrt{4}$

$= 9 - 2\sqrt{6} - 16$
$= -7 - 2\sqrt{6}$

e)

	$2\sqrt{5}$	$-3\sqrt{7}$
$2\sqrt{5}$	$4\sqrt{25}$	$-6\sqrt{35}$
$-3\sqrt{7}$	$-6\sqrt{35}$	$9\sqrt{49}$

$= 20 - 12\sqrt{35} + 63$
$= 83 - 12\sqrt{35}$

f)

	1	$-\sqrt{3}$
2	2	$-2\sqrt{3}$
$\sqrt{6}$	$\sqrt{6}$	$-\sqrt{18}$

	2	$-2\sqrt{3}$	$\sqrt{6}$	$-\sqrt{18}$
5	10	$-10\sqrt{3}$	$5\sqrt{6}$	$-5\sqrt{18}$
$\sqrt{2}$	$2\sqrt{2}$	$-2\sqrt{6}$	$\sqrt{12}$	$-\sqrt{36}$

$= 10 - 10\sqrt{3} + 3\sqrt{6} - 15\sqrt{2} + 2\sqrt{2}$
$+ 2\sqrt{3} - 6$
$= 4 - 8\sqrt{3} + 3\sqrt{6} - 13\sqrt{2}$

Attachments

Simplifying Radicals Video 1.swf

Simplifying Radicals video.swf