

1. Express as a single radical in mixed radical form, where possible.

a).  $\sqrt{5} \times \sqrt{6}$

$$\sqrt{30}$$

b).  $\sqrt{7} \times \sqrt{8}$

$$2\sqrt{14}$$

c).  $\sqrt{12} \times \sqrt{10}$

$$2\sqrt{30}$$

d).  $3\sqrt{5} \times \sqrt{15}$

$$15\sqrt{3}$$

e).  $-\sqrt{26} \times -3\sqrt{10} \times -\sqrt{3}$

$$-6\sqrt{195}$$

f).  $\sqrt{105} \times \sqrt{15} \times 2\sqrt{25}$

$$150\sqrt{7}$$

2. Expand and simplify.

a).  $\sqrt{2} (4 + 5\sqrt{3})$

$$4\sqrt{2} + 5\sqrt{6}$$

b).  $-7\sqrt{6} (6\sqrt{8} - 2)$

$$-168\sqrt{3} + 14\sqrt{6}$$

c).  $(\sqrt{3} + \sqrt{7})(5 + 2\sqrt{10})$

$$5\sqrt{3} + 2\sqrt{30} + 5\sqrt{7} + 2\sqrt{70}$$

d).  $(3\sqrt{5} - 4)^2$

$$61 - 24\sqrt{5}$$

e).  $(2\sqrt{3} + 3\sqrt{5})(2\sqrt{3} - 3\sqrt{5})$

$$-33$$

f).  $(-\sqrt{7} + 2\sqrt{11})^2$

$$37 - 4\sqrt{77}$$

3. Simplify. Express your answer in simplest form.

a).  $\frac{2\sqrt{10}}{\sqrt{5}}$

$2\sqrt{2}$

b).  $\frac{-13\sqrt{12}}{26\sqrt{6}}$

$-\frac{\sqrt{2}}{2}$

c).  $\frac{12\sqrt{7}}{-2\sqrt{7}}$

$-6$

d).  $\frac{27\sqrt{15}}{-9\sqrt{3}}$

$-3\sqrt{5}$

e).  $\frac{-2\sqrt{96}}{\sqrt{8}}$

$-4\sqrt{3}$

f).  $\frac{8\sqrt{8}}{-2\sqrt{2}}$

$-8$

4. Rationalize the denominator in each expression.

a).  $\frac{\sqrt{10}}{\sqrt{3}}$

$\frac{\sqrt{30}}{3}$

b).  $\frac{-3}{2\sqrt{5}}$

$-\frac{3\sqrt{5}}{10}$

c).  $\frac{5\sqrt{10}}{\sqrt{7}}$

$\frac{5\sqrt{70}}{7}$

d).  $\frac{-3\sqrt{50}}{\sqrt{3}}$

$-5\sqrt{6}$

e).  $\frac{2\sqrt{2} - \sqrt{5}}{3\sqrt{5}}$

$\frac{2\sqrt{10} - 5}{15}$

f).  $\frac{\sqrt{5} + 2\sqrt{3}}{\sqrt{3}}$

$\frac{\sqrt{15} + 6}{3}$