

## 5.2 Part 1 Multiplying Radicals

Name \_\_\_\_\_ Date: \_\_\_\_\_ Block \_\_\_\_\_

1. Multiply. Express answers in simplified radical form.

a.  $(\sqrt{7})^2$

b.  $(-2\sqrt{5})^2$

c.  $(\sqrt{2})(\sqrt{18})$

d.  $(\sqrt{18})(\sqrt{27})$

e.  $-2\sqrt{3}(5\sqrt{6})$

f.  $4\sqrt{3}(-\sqrt{12})$

g.  $(\sqrt{54})(\sqrt{18})(\sqrt{24})$

h.  $(\sqrt{3})^2 \times 2\sqrt{3}$

i.  $(2^3\sqrt{5})^3$

j.  $(\sqrt{x^7})(\sqrt{x^3})$

k.  $-2^3\sqrt{6y}(-5^3\sqrt{9y^2})$

l.  $(-3x\sqrt{xy^2})(2xy^2\sqrt{x^2y})$

2. Multiply using the distributive property, then simplify.

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

b.  $2\sqrt{3}(5\sqrt{3}-4\sqrt{7})$

c.  $\sqrt{y}(1+6\sqrt{y})$

d.  $x\sqrt{3}(x\sqrt{6}-2x+\sqrt{3})$

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

f.  $5^3\sqrt{3}(2^3\sqrt{9}-4^3\sqrt{6})$

g.  $-4(2\sqrt{3}-5)+10\sqrt{3}$

h.  $\sqrt{2x}(\sqrt{2}-\sqrt{x})-5\sqrt{x}$

i.  $9-^3\sqrt{4k}(\sqrt[3]{2k}+\sqrt[3]{2k^2})$

3. Multiply each. Compare your answer to what you started with each time.

a.  $(\sqrt{4})(\sqrt{4})$

b.  $(\sqrt{2a})(\sqrt{2a})$

c.  $(\sqrt{7})(\sqrt{7})$

d. If you multiply two square roots with the same radicand, what is the result?

4. Expand and simplify each product.

a.  $(1 + \sqrt{2})(1 + \sqrt{2})$

b.  $(1 + \sqrt{2})(1 - \sqrt{2})$

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

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

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

f.  $(\sqrt{3} - \sqrt{2})^2$

g.  $(\sqrt{x} + \sqrt{2})(\sqrt{x} - \sqrt{2})$

h.  $(2x - \sqrt{3})(1 + \sqrt{3x^3})$

i.  $(3\sqrt{y} + \sqrt{x})^2$

5. Multiply each pair of conjugates mentally.

a.  $(7 + \sqrt{5})(7 - \sqrt{5})$

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

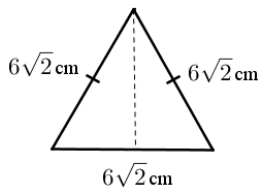
c.  $(3\sqrt{2} + 1)(3\sqrt{2} - 1)$

d.  $(\sqrt{x} - y)(\sqrt{x} + y)$

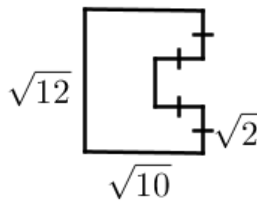
e.  $(2\sqrt{x} + \sqrt{y})(2\sqrt{x} - \sqrt{y})$

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

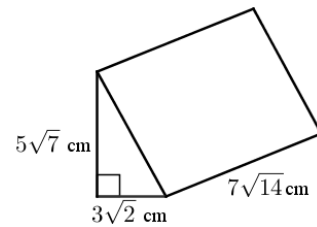
6. Use the Pythagorean Theorem to determine the height of the triangle. Then determine the area.



7. Determine the area.



8. Determine the volume.



### Answers

- 1a. 7 b. 20 c. 6 d.  $9\sqrt{6}$  e.  $-30\sqrt{2}$  f. -24 g.  $108\sqrt{2}$  h.  $6\sqrt{3}$  i. 40 j.  $x^5$  k.  $30y^3\sqrt{2}$  l.  $-6x^3y^3\sqrt{xy}$   
 2a.  $5\sqrt{3} - 4\sqrt{6}$  b.  $30 - 8\sqrt{21}$  c.  $\sqrt{y} + 6y$  d.  $3x^2\sqrt{2} - 2x^2\sqrt{3} + 3x$  e.  $10^3\sqrt{6} - 4$  f.  $30 - 20^3\sqrt{18}$  g.  $2\sqrt{3} + 20$  h.  
 $-3\sqrt{x} - x\sqrt{2}$  i.  $-2^3\sqrt{k^2} - 2k + 9$  3a. 4 b. 2a c. 7 d. The product works out to be the radicand without the root sign.  
 4a.  $3 + 2\sqrt{2}$  b. -1 c.  $14 + 6\sqrt{5}$  d. 4 e.  $5 + 2\sqrt{6}$  f.  $5 - 2\sqrt{6}$  g.  $x - 2$  h.  $2x + 2x^2\sqrt{3x} - \sqrt{3} - 3x\sqrt{x}$  i.  
 $9y + 6\sqrt{xy} + x$  5a. 44 b. -47 c. 17 d.  $x - y^2$  e.  $4x - y$  f.  $45 - 4y$  6.  $h = 3\sqrt{6}$  cm,  $A = 18\sqrt{3}$  cm<sup>2</sup> 7.  
 $2\sqrt{30} - 2\sqrt{6} + 4$  units<sup>2</sup> 8. 735 cm<sup>3</sup>

