

**LESSON 122** .....

1.  $3\sqrt{3}$     2.  $2x^2$     3.  $-4$     4.  $3 - \sqrt{7}$   
 5. B    6.  $x = 4$     7.  $x = 13$   
 8.  $f(x) = \sqrt{x+2} + 1$     9. C    10. 5 feet

*Worked-out solutions:*

1.  $\sqrt{27} = \sqrt{9 \cdot 3} = \sqrt{9} \cdot \sqrt{3} = 3\sqrt{3}$
2.  $\sqrt[3]{8x^6} = \sqrt[3]{8 \cdot (x^2)^3} = \sqrt[3]{8} \cdot \sqrt[3]{(x^2)^3} = 2x^2$
3.  $\sqrt{2} \cdot \sqrt{8} - 2\sqrt{18} + \sqrt{50}$   
 $= \sqrt{16} - 6\sqrt{2} + 5\sqrt{2} = 4 - \sqrt{2}$   
 $ab = (4)(-1) = -4$
4.  $\frac{2}{3 + \sqrt{7}} = \frac{2}{3 + \sqrt{7}} \cdot \frac{3 - \sqrt{7}}{3 - \sqrt{7}} = \frac{2(3 - \sqrt{7})}{9 - 7} = 3 - \sqrt{7}$
5. A)  $4^{3/2} = (2^2)^{3/2} = 2^3 = 8$   
 B)  $9^{3/2} = (3^2)^{3/2} = 3^3 = 27$   
 C)  $16^{3/4} = (2^4)^{3/4} = 2^3 = 8$   
 D)  $64^{2/3} = (4^3)^{2/3} = 4^2 = 16$
6.  $\sqrt{8-x} = x - 2$   
 $8 - x = (x - 2)^2$     Square both sides.  
 $x^2 - 3x - 4 = 0$     Write in standard form.  
 $(x + 1)(x - 4) = 0$     Solve for  $x$ .  
 $x = -1, x = 4$   
 $x = -1$  is extraneous, so the solution is  $x = 4$ .
7.  $(x - 5)^{1/3} - 2 = 0$   
 $(x - 5)^{1/3} = 2$     Isolate the power.  
 $[(x - 5)^{1/3}]^3 = 2^3$     Cube both sides.  
 $x - 5 = 8$     Simplify.  
 $x = 13$     Solve for  $x$ .
8.  $y = \sqrt{x}$     Parent function  
 $y = \sqrt{x+2}$     Shift left 2 units.  
 $f(x) = \sqrt{x+2} + 1$     Shift up 1 unit.
9. The graph involves a reflection of  $y = \sqrt[3]{x}$  over either the  $x$ - or  $y$ -axis, so eliminate A and B.  
 $(0, 1)$  is on the graph, so choose C.
10. The ladder, wall, and ground form a right triangle.  
 Hypotenuse = 13, Legs = 12 and  $x$   
 By The Pythagorean Theorem,  $12^2 + x^2 = 13^2$ .  
 Solve for  $x$ , and you get  $x = 5$ .  
 The bottom is 5 feet from the wall.