

## Exit Ticket Sample Solutions

1. Solve  $\sqrt{2x + 15} = x + 6$ . Verify the solution(s).

$$2x + 15 = x^2 + 12x + 36$$

$$0 = x^2 + 10x + 21$$

$$0 = (x + 3)(x + 7)$$

The solutions are  $-3$  and  $-7$ .

Check  $x = -3$ :

$$\sqrt{2(-3) + 15} = \sqrt{9} = 3$$

$$-3 + 6 = 3$$

So,  $-3$  is a valid solution.

Check  $x = -7$ :

$$\sqrt{2(-7) + 15} = \sqrt{1} = 1$$

$$-7 + 6 = -1$$

Since  $-1 \neq 1$ , we see that  $-7$  is an extraneous solution.

Therefore, the only solution to the original equation is  $-3$ .

2. Explain why it is necessary to check the solutions to a radical equation.

Raising both sides of an equation to a power can produce an equation whose solution set is not equivalent to that of the original equation. In the problem above,  $x = -7$  does not satisfy the equation.

## Homework Problem Set Sample Solutions

1. Solve.

A.  $\sqrt{2x - 5} - \sqrt{x + 6} = 0$

11

B.  $\sqrt{2x - 5} + \sqrt{x + 6} = 0$

No solution

C.  $\sqrt{x - 5} - \sqrt{x + 6} = 2$

No solution

D.  $\sqrt{2x - 5} - \sqrt{x + 6} = 2$

43

E.  $\sqrt{x + 4} = 3 - \sqrt{x}$

25

36

F.  $\sqrt{x + 4} = 3 + \sqrt{x}$

No solution

G.  $\sqrt{x+3} = \sqrt{5x+6} - 3$

6

H.  $\sqrt{2x+1} = x - 1$

4

I.  $\sqrt{x+12} + \sqrt{x} = 6$

4

J.  $2\sqrt{x} = 1 - \sqrt{4x-1}$

 $\frac{1}{4}$ 

K.  $2x = \sqrt{4x-1}$

 $\frac{1}{2}$ 

L.  $\sqrt{4x-1} = 2 - 2x$

 $\frac{1}{2}$ 

M.  $x + 2 = 4\sqrt{x-2}$

6

N.  $\sqrt{2x-8} + \sqrt{3x-12} = 0$

4

O.  $x = 2\sqrt{x-4} + 4$

4, 8

P.  $x - 2 = \sqrt{9x-36}$

5, 8

2. Consider the right triangle  $ABC$  shown to the right, with  $AB = 8$  and  $BC = x$ .

A. Write an expression for the length of the hypotenuse in terms of  $x$ .

$$AC = \sqrt{64 + x^2}$$

B. Find the value of  $x$  for which  $AC - AB = 9$ .

The solutions to the mathematical equation  $\sqrt{64 + x^2} - 8 = 9$  are  $-15$  and  $15$ . Since lengths must be positive,  $-15$  is an extraneous solution, and  $x = 15$ .

