Transitions to College Mathematics
Review 1.6

Name Key

***SHOW ALL WORK!***

1. Solve.

$(\sqrt{x+10})^2 = (8)^2$

$x+10 = 64$

$x = 54$

$\sqrt{54+10} = 8$

$\sqrt{64} = 8$ ✓

2. Solve.

$(|2x-5|)^2 = (11)^2$

$4x^2 - 20x + 25 = 121$

$4x^2 - 20x - 96 = 0$

$4(x^2 - 5x - 24) = 0$

$4(x-8)(x+3) = 0$

$x = 8$ $x = -3$

$|2(8)-5| = 11$ $|2(-3)-5| = 11$

$|16-5| = 11$ $|-6-5| = 11$

$|11| = 11$ ✓ $|-11| = 11$

3. Solve.

$(\sqrt{3x+6})^2 = (6)^2$

$3x+6 = 36$

$3x = 30$

$x = 10$

$\sqrt{3(10)+6} = 6$

$\sqrt{30+6} = 6$

$\sqrt{36} = 6$

4. Solve.

$(|x+1|)^2 = (3)^2$

$x^2 + 2x + 1 = 9$

$x^2 + 2x - 8 = 0$

$(x+4)(x-2) = 0$

$x = -4$ $x = 2$

$|-4+1| = 3$ $|2+1| = 3$

$|-3| = 3$

5. Solve.

$$x - 10\sqrt{x} + 9 = 0$$

let $u = \sqrt{x}$

$u^2 - 10u + 9 = 0$

$(u - 9)(u - 1) = 0$

$u = 9$ $\quad$ $u = 1$

$\sqrt{x} = 9$ $\quad$ $\sqrt{x} = 1$

$x = 81$ $\quad$ $x = 1$

$81 - 10\sqrt{81} + 9 = 0$ $\quad$ $1 - 10\sqrt{1} + 9 = 0$

$81 - 90 + 9 = 0$ $\quad$ $1 - 10 + 9 = 0$

$0 = 0$

6. Solve.

$$2x^{2/3} + 5x^{1/3} + 3 = 0$$

let $u = x^{1/3} = \sqrt[3]{x}$

$2u^2 + 5u + 3 = 0$

$(2u + 3)(u + 1) = 0$

$u = -3/2$ $\quad$ $u = -1$

$(x^{1/3})^3 = (-3/2)^3$ $\quad$ $(x^{1/3})^3 = (-1)^3$

$x = -27/8$ $\quad$ $x = -1$

7. Solve.

$$\sqrt{x+5} + \sqrt{x-5} = 10$$

$(\sqrt{x+5})^2 = (10 - \sqrt{x-5})^2$

$x + 5 = 100 - 20\sqrt{x-5} + (x-5)$

$(90)^2 = (-20\sqrt{x-5})^2$

$8100 = 400(x-5)$

$8100 = 400x - 2000$

$10100 = 400x$

$\frac{101}{4} = x$

$\sqrt{\frac{101}{4} + 5} + \sqrt{\frac{101}{4} - 5} = 10$

$\sqrt{\frac{101}{4} + \frac{20}{4}} + \sqrt{\frac{101}{4} - \frac{20}{4}} = 10$

$\frac{11}{2} + \frac{9}{2} = 10$

$\frac{20}{2} = 10$ ✓

8. Solve.

$$\sqrt{x} + \sqrt{x-20} = 10$$

$(\sqrt{x})^2 = (10 - \sqrt{x-20})^2$

$x = 100 - 20\sqrt{x-20} + (x-20)$

$(-80)^2 = (-20\sqrt{x-20})^2$

$6400 = 400(x-20)$

$16 = x - 20$

$36 = x$

$\sqrt{36} + \sqrt{36-20} = 10$

$6 + \sqrt{16} = 10$

$6 + 4 = 10$ ✓