

**Ch. 11 Review**

Tuesday, May 27, 2014  
7:40 AM

(1-10) Simplify the following expressions.

$$\begin{aligned}
 1. \quad & 3\sqrt{24} + \sqrt{36} \\
 & 3\sqrt{4 \cdot 6} + 6 \\
 & 3 \cdot 2\sqrt{6} + 6 \\
 & \boxed{6\sqrt{6} + 6}
 \end{aligned}$$

$$\begin{aligned}
 2. \quad & \sqrt{4a^{30}b^7} \\
 & 2a^{15}\sqrt{b^6 \cdot b} \\
 & \boxed{2a^{15}b^3\sqrt{b}}
 \end{aligned}$$

$$\begin{aligned}
 3. \quad & \sqrt{18} + 2\sqrt{2} \\
 & \sqrt{2 \cdot 9} + 2\sqrt{2} \\
 & 3\sqrt{2} + 2\sqrt{2} \\
 & \boxed{5\sqrt{2}}
 \end{aligned}$$

$$\begin{aligned}
 4. \quad & -3\sqrt{6}(3\sqrt{2} - 4\sqrt{6}) \\
 & -9\sqrt{12} + 12\sqrt{36} \\
 & -9\sqrt{4 \cdot 3} + 12 \cdot 6 \\
 & -9 \cdot 2\sqrt{3} + 72 \\
 & \boxed{-18\sqrt{3} + 72}
 \end{aligned}$$

$$\begin{aligned}
 5. \quad & 5\sqrt{5} \cdot 2\sqrt{2} \\
 & \boxed{10\sqrt{10}}
 \end{aligned}$$

$$\begin{aligned}
 6. \quad & (1 - \sqrt{14})(1 + \sqrt{14}) \\
 & 1 + \sqrt{14} - \sqrt{14} - \sqrt{14} \cdot \sqrt{14} \\
 & 1 - 14 \\
 & \boxed{-13}
 \end{aligned}$$

$$\begin{aligned}
 7. \quad & \frac{\sqrt{30}}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{6}} \\
 & \frac{\sqrt{150}}{5} = \frac{\sqrt{25 \cdot 6}}{5} \\
 & = \frac{5\sqrt{6}}{5} = \boxed{\sqrt{6}}
 \end{aligned}$$

$$\begin{aligned}
 8. \quad & \frac{7}{\sqrt{7}} \cdot \frac{\sqrt{7}}{\sqrt{7}} = \frac{7\sqrt{7}}{7} = \boxed{\sqrt{7}}
 \end{aligned}$$

$$\begin{aligned}
 9. \quad & \sqrt{\frac{13}{64}} = \frac{\sqrt{13}}{\sqrt{64}} = \boxed{\frac{\sqrt{13}}{8}}
 \end{aligned}$$

$$\begin{aligned}
 10. \quad & -3\sqrt{14} \cdot 3\sqrt{12} \\
 & -3\sqrt{14} \cdot 3\sqrt{4 \cdot 3} \\
 & -3\sqrt{14} \cdot 3 \cdot 2\sqrt{3} \\
 & \boxed{-18\sqrt{42}}
 \end{aligned}$$

$$\begin{aligned}
 11. \quad & \sqrt{24x^2} \cdot \sqrt{24x^2} \\
 & \boxed{24x^2}
 \end{aligned}$$

$$\begin{aligned}
 12. \quad & \sqrt{44d^{31}g^{16}} \\
 & g^8 \sqrt{4 \cdot 11 \cdot d^{30} \cdot d} \\
 & \boxed{2d^{15}g^8\sqrt{11d}}
 \end{aligned}$$

(13-18) Solve for x. Remember to check for Extraneous Solutions.

$$\begin{aligned}
 13. \quad & 8^2 = (\sqrt{3x-2})^2 \\
 & 64 = 3x - 2 \\
 & \quad \quad +2 \quad \quad +2 \\
 \hline
 & \frac{66}{3} = \frac{3x}{3} \\
 & \boxed{22 = x}
 \end{aligned}$$

*check!*

$$\begin{aligned}
 8 &= \sqrt{3(22)-2} \\
 8 &= \sqrt{66-2} \\
 8 &= \sqrt{64} \\
 8 &= 8\checkmark
 \end{aligned}$$

$$\begin{aligned}
 14. \quad & \sqrt{x-7} + 6 = 10 \\
 & \quad \quad -6 \quad -6 \\
 & \sqrt{x-7} = 4^2 \\
 & x-7 = 16 \\
 & \quad \quad +7 \quad +7 \\
 \hline
 & \boxed{x = 23}
 \end{aligned}$$

*check!*

$$\begin{aligned}
 \sqrt{23-7} + 6 &= 10 \\
 \sqrt{16} + 6 &= 10 \\
 4 + 6 &= 10 \\
 10 &= 10\checkmark
 \end{aligned}$$

$$15. \sqrt{6x-3} + 10 = 1$$

$$\frac{-10 \quad -10}{(\sqrt{6x-3})^2 = (-9)^2}$$

$$6x - 3 = 81$$

$$6x = 84$$

$$x = \cancel{14}$$

**no solution**

check!

$$\sqrt{6(14)-3} + 10 = 1$$

$$\sqrt{84-3} + 10 = 1$$

$$\sqrt{81} + 10 = 1$$

$$9 + 10 \neq 1$$

$$16. x^2 = (\sqrt{3x-2})^2$$

$$\frac{x^2 = 3x-2}{-3x+2 \quad -3x+2}$$

$$x^2 - 3x + 2 = 0$$

$$(x-2)(x-1) = 0$$

$$x=2 \quad x=1$$

check!

$$2 = \sqrt{3(2)-2}$$

$$2 = \sqrt{6-2}$$

$$2 = \sqrt{4}$$

$$2 = 2 \checkmark$$

$$1 = \sqrt{3(1)-2}$$

$$1 = \sqrt{1}$$

$$1 = 1 \checkmark$$

$$17. \sqrt{x-7} - \sqrt{2x+3} = 0$$

$$\frac{+\sqrt{2x+3} \quad +\sqrt{2x+3}}{(\sqrt{x-7})^2 = (\sqrt{2x+3})^2}$$

$$\frac{x-7 = 2x+3}{-2x+7 \quad -2x+7}$$

$$\frac{-x = 10}{-1 \quad -1}$$

$$x = \cancel{-10}$$

check!

$$\sqrt{(-10)-7} - \sqrt{2(-10)+3} = 0$$

$$\sqrt{-17} - \sqrt{-17} = 0$$

**no solution!**

$$18. \sqrt{6x-5} + x = 0$$

$$\frac{-x \quad -x}{(\sqrt{6x-5})^2 = (-x)^2}$$

$$6x-5 = x^2$$

$$x^2 - 6x + 5 = 0$$

$$(x-5)(x-1) = 0$$

$$x=5 \quad x=1$$

check!

$$\sqrt{6(5)-5} + (5) = 0$$

$$\sqrt{25} + 5 = 0$$

$$10 \neq 0$$

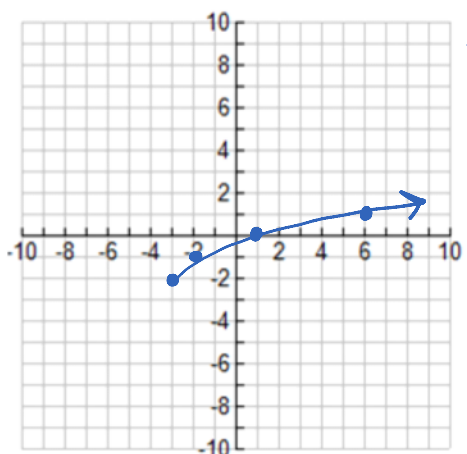
$$\sqrt{6(1)-5} + 1 = 0$$

$$\sqrt{1} + 1 = 0$$

$$2 \neq 0$$

(19-20) Graph the following radical equations. State the domain and range.

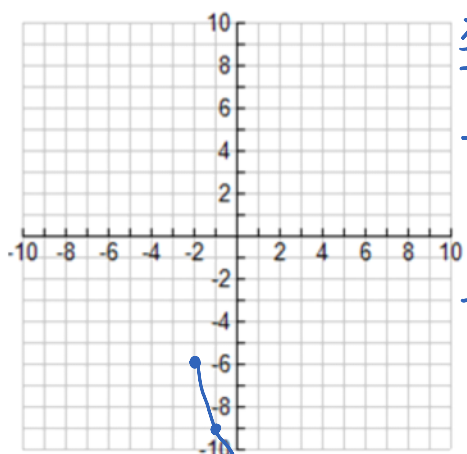
$$19. y = \sqrt{x+3} - 2$$



D:  $[-3, \infty)$   
R:  $[-2, \infty)$

x	y
-3	$\sqrt{0} - 2 = -2$
-2	$\sqrt{1} - 2 = -1$
1	$\sqrt{4} - 2 = 0$
6	$\sqrt{9} - 2 = 1$

$$20. y = -3\sqrt{x+2} - 6$$



D:  $[-2, \infty)$   
R:  $(-\infty, -6]$

x	y
-2	$-3\sqrt{0} - 6 = -6$
-1	$-3\sqrt{1} - 6 = -9$
2	$-3\sqrt{4} - 6 = -12$
7	$-3\sqrt{9} - 6 = -15$