

Operations with Radicals Review

Simplify.

$$1) \underbrace{2\sqrt{5} + 2\sqrt{5}} = \boxed{4\sqrt{5}}$$

$$2) 8\sqrt{x+2} - 3\sqrt{x+2}$$

$$\boxed{5\sqrt{x+2}}$$

$$3) -9\sqrt{x} + 3\sqrt{x} = \boxed{-6\sqrt{x}}$$

$$4) 7\sqrt{y-5} - 4\sqrt{y-5} = \boxed{3\sqrt{y-5}}$$

$$5) 2\sqrt{8} \cdot 3\sqrt{8} = 6\sqrt{64} \\ = 6 \cdot 8 = \boxed{48}$$

$$6) \sqrt{10} \cdot \sqrt{10} = \sqrt{100} = \boxed{10}$$

$$7) \overbrace{(2 + \sqrt{3+x})(2 + \sqrt{3+x})}$$

$$4 + 4\sqrt{3+x} + 3+x$$

$$\boxed{7 + 4\sqrt{3+x} + x}$$

$$8) (5 + \sqrt{2r})(-1 + \sqrt{2r}) = \boxed{-5 + 4\sqrt{2r} + 2r}$$

$$9) (3 + \sqrt{x})(3 + \sqrt{x})$$

$$\boxed{9 + 6\sqrt{x} + x}$$

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

$$\boxed{x - 10\sqrt{x} + 25}$$

Honors Math 3 - Solving Radical Equations Review from Math 2

$(6) * m^{\frac{3}{2}} = 16$
 $m = \pm 4^{\frac{2}{3}}$ **64, -64**
 EVEN KDDT!

* isolate the radical *

Solve each of the following radical equations. Be sure to check for extraneous solutions.

1. $3\sqrt{2x} - 3 = 9$

$$\begin{aligned} +3 & +3 \\ \frac{3\sqrt{2x}}{3} &= \frac{12}{3} \\ \sqrt{2x} &= 4 \end{aligned}$$

$$(\sqrt{2x})^2 = 4^2$$

$$\frac{2x}{2} = \frac{16}{2}$$

$$x = 8 \checkmark$$

$3\sqrt{2 \cdot 8} - 3 = 9$
 $12 - 3 = 9 \checkmark$

2. $3\sqrt[4]{2x+3} = -9$

$$\frac{3\sqrt[4]{2x+3}}{3} = \frac{-9}{3}$$

$$\sqrt[4]{2x+3} = -3$$

$$(\sqrt[4]{2x+3})^4 = (-3)^4$$

$$2x+3 = 81$$

$$2x = 78$$

$$x = 39$$

$(7) -2x = \sqrt{6x+4}$ $x = \frac{-1}{2}$ ~~A~~

$(8) \sqrt{b+14} - \sqrt{2b+5} = 1$ \rightarrow
 $b = \frac{1}{2}$

3. $(\sqrt{4x-10})^2 = (3\sqrt{x-5})^2$

$$4x-10 = 9(x-5)$$

$$4x-10 = 9x-45$$

$$35 = 5x$$

$$x = 7 \checkmark$$

$(9) \sqrt{x+7} - \sqrt{3-x} = -2$

4. $(x-9)^{\frac{1}{3}} = (x^{\frac{1}{3}})^3$

$$x-9 = x$$

$$-9 = 0$$

NO SOLUTION

NOTE: $x^{\frac{1}{3}} = \sqrt[3]{x}$

$x = \frac{1}{2}$ ~~6~~

$\sqrt{x+2} - \sqrt{x-2} = \sqrt{2x}$
 $x = \frac{1}{2}$
 -2 extra
 nears

5. $(\sqrt{x^2+3})^2 = (x+1)^2$ FOIL!

$$x^2+3 = x^2+2x+1$$

$$3 = 2x+1$$

$$2 = 2x$$

$$x = 1 \checkmark$$

$\sqrt[3]{6x+9} + 8 = 5$
 $x = -6$

$$\textcircled{8} \sqrt{3y+1} = \sqrt{2y+6}$$

$$3y+1 = 2y+6$$

$$\boxed{y=5}$$

$$\textcircled{9} \sqrt{y-5} + \sqrt{y} = 5$$

$$\sqrt{y-5} = (5-\sqrt{y})$$

$$y-5 = (5-\sqrt{y})(5-\sqrt{y})$$

$$y-5 = 25 - 10\sqrt{y} + y$$

$$-30 = -10\sqrt{y}$$

$$3 = \sqrt{y}$$

$$\boxed{y=9}$$

$$\textcircled{10} \sqrt{4y+1} - \sqrt{y-2} = 3$$

$$\sqrt{4y+1} = (3+\sqrt{y-2})$$

$$4y+1 = (3+\sqrt{y-2})(3+\sqrt{y-2})$$

$$4y+1 = 9 + 6\sqrt{y-2} + y-2$$

$$4y+1 = 7 + y + 6\sqrt{y-2}$$

$$(3y-6)^2 = (6\sqrt{y-2})^2$$

$$9y^2 - 36y + 36 = 36(y-2)$$

$$9y^2 - 36y + 36 = 36y - 72$$

$$9y^2 - 72y + 108 = 0$$

$$9(y^2 - 8y + 12) = 0$$

$$9(y-6)(y-2) = 0$$

$$\boxed{y=2, 6}$$