

NAME _____

DATE _____

RADICAL EQUATIONS: Worksheet 1

Simplify the following.

1) $\sqrt{20}$

2) $\sqrt{27}$

3) $\sqrt{75}$

4) $\sqrt{40}$

5) $3\sqrt{3} + 5\sqrt{3}$

6) $5\sqrt{5} - 2\sqrt{2} - 3\sqrt{5} + 3\sqrt{2}$

7) $6\sqrt{a} - 11\sqrt{a}$

8) $\sqrt{3} + 2\sqrt{7} + \sqrt{3} - 5\sqrt{7}$

9) $6\sqrt{2} \cdot 3\sqrt{5}$

10) $5\sqrt{7} \cdot 3\sqrt{2}$

11) $\sqrt{3} \cdot \sqrt{3}$

12) $6\sqrt{2} \cdot 4\sqrt{2}$

13) $\sqrt{5a} \cdot 5\sqrt{a}$

14) $\sqrt{3}(\sqrt{7} + \sqrt{3})$

15) $8\sqrt{5}(\sqrt{5} + 2)$

16) $\sqrt{6}(\sqrt{3} + \sqrt{2})$

17) $\sqrt{11}(\sqrt{2} + \sqrt{11})$

18) $\frac{2}{\sqrt{3}}$

19) $\frac{8}{\sqrt{2}}$

20) $\frac{3}{\sqrt{a}}$

21) $\frac{6}{\sqrt{y+3}}$

Solve each radical equation.

22) $\sqrt{2x} = 8$

23) $\sqrt{10w} = 4$

24) $\sqrt{x+3} = 5$

25) $\sqrt{3t-2} = 4$

26) $\sqrt{6x+3} = 3$

27) $\sqrt{5t-4} + 2 = 8$

28) $\sqrt{8a-7} + 1 = 6$

29) $\sqrt{6w+16} - 3 = -1$

30) $\sqrt{x+1} = 1$

KEY

RADICAL EQUATIONS: Worksheet 1

Simplify the following.

$$1) \frac{\sqrt{20}}{2\sqrt{5}} \qquad 2) \frac{\sqrt{27}}{3\sqrt{3}} \qquad 3) \frac{\sqrt{75}}{5\sqrt{3}} \qquad 4) \frac{\sqrt{40}}{2\sqrt{10}}$$

$$5) \frac{3\sqrt{3} + 5\sqrt{3}}{8\sqrt{3}} \qquad 6) \frac{5\sqrt{5} - 2\sqrt{2} - 3\sqrt{5} + 3\sqrt{2}}{2\sqrt{5} + \sqrt{2}}$$

$$7) \frac{6\sqrt{a} - 11\sqrt{a}}{-5\sqrt{a}} \qquad 8) \frac{\sqrt{3} + 2\sqrt{7} + \sqrt{3} - 5\sqrt{7}}{2\sqrt{3} - 3\sqrt{7}}$$

$$9) \frac{6\sqrt{2} \cdot 3\sqrt{5}}{18\sqrt{10}} \qquad 10) \frac{5\sqrt{7} \cdot 3\sqrt{2}}{15\sqrt{14}} \qquad 11) \frac{\sqrt{3} \cdot \sqrt{3}}{3}$$

$$12) \frac{6\sqrt{2} \cdot 4\sqrt{2}}{48} \qquad 13) \frac{\sqrt{5a} \cdot 5\sqrt{a}}{5a\sqrt{5}} \qquad 14) \frac{\sqrt{3}(\sqrt{7} + \sqrt{3})}{\sqrt{21} + 3}$$

$$15) \frac{8\sqrt{5}(\sqrt{5} + 2)}{40 + 16\sqrt{5}} \qquad 16) \frac{\sqrt{6}(\sqrt{3} + \sqrt{2})}{3\sqrt{2} + 2\sqrt{3}} \qquad 17) \frac{\sqrt{11}(\sqrt{2} + \sqrt{11})}{\sqrt{22} + 11}$$

$$18) \frac{2}{\sqrt{3}} \qquad 19) \frac{8}{\sqrt{2}}$$

$$\frac{2}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{2\sqrt{3}}{3} \qquad \frac{8}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{8\sqrt{2}}{2} = 4\sqrt{2}$$

$$20) \quad \frac{3}{\sqrt{a}}$$

$$\frac{3}{\sqrt{a}} \cdot \frac{\sqrt{a}}{\sqrt{a}} = \frac{3\sqrt{a}}{a}$$

$$21) \quad \frac{6}{\sqrt{y+3}}$$

$$\frac{6}{\sqrt{y+3}} \cdot \frac{\sqrt{y+3}}{\sqrt{y+3}} = \frac{6\sqrt{y+3}}{y+3}$$

Solve each radical equation.

$$22) \quad \sqrt{2x} = 8$$

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

$$2x = 64$$

$$x = 32$$

$$23) \quad \sqrt{10w} = 4$$

$$(\sqrt{10w})^2 = 4^2$$

$$10w = 16$$

$$w = 1.6$$

$$24) \quad \sqrt{x+3} = 5$$

$$(\sqrt{x+3})^2 = 5^2$$

$$x+3 = 25$$

$$x = 22$$

$$25) \quad \sqrt{3t-2} = 4$$

$$(\sqrt{3t-2})^2 = 4^2$$

$$3t-2 = 16$$

$$3t = 18$$

$$t = 6$$

$$26) \quad \sqrt{6x+3} = 3$$

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

$$6x+3 = 9$$

$$6x = 6$$

$$x = 1$$

$$27) \quad \sqrt{5t-4} + 2 = 8$$

$$\sqrt{5t-4} = 6$$

$$(\sqrt{5t-4})^2 = 6^2$$

$$5t-4 = 36$$

$$5t = 40$$

$$t = 8$$

$$28) \quad \sqrt{8a-7} + 1 = 6$$

$$\sqrt{8a-7} = 5$$

$$(\sqrt{8a-7})^2 = 5^2$$

$$8a-7 = 25$$

$$8a = 32$$

$$a = 4$$

$$29) \quad \sqrt{6w+16} - 3 = -1$$

$$\sqrt{6w+16} = 2$$

$$(\sqrt{6w+16})^2 = 2^2$$

$$6w+16 = 4$$

$$6w = -12$$

$$w = -2$$

$$30) \quad \sqrt{x+1} = 1$$

$$(\sqrt{x+1})^2 = 1^2$$

$$x+1 = 1$$

$$x = 0$$