

Simplifying Radicals

exact

Simplify each radical. Show work.

1. $\sqrt{50}$ $5\sqrt{2}$

5 10
2 5

2. $\sqrt{24}$ $2\sqrt{6}$

6 4
2 3 2 2

3. $\sqrt{18}$ $3\sqrt{2}$

2 9 3 3

4. $\sqrt{600}$ $10\sqrt{6}$

6 100
10 10

5. $\sqrt{1600}$ 40

16 100
4 4 10 10

6. $\sqrt{8}$ $2\sqrt{2}$

2 2 2

7. $\sqrt{27}$ $3\sqrt{3}$

9 3
3 3

8. $\sqrt{48}$ $4\sqrt{3}$

6 8
2 3 2 2 2

9. $\sqrt{576}$ 24

2 2 8 8
2 14 4
12 12

10. $\sqrt{500}$ $10\sqrt{5}$

5 100
10 10

11. $\sqrt{180}$ $6\sqrt{5}$

18 10
6 3 2 5
2 3

12. $\sqrt{98}$ $7\sqrt{2}$

2 49
7 7

Simplify each fraction. Show work.

16. $\frac{\sqrt{2} \sqrt{7}}{\sqrt{7} \sqrt{7}} = \frac{\sqrt{14}}{7}$

17. $\frac{\sqrt{8}}{\sqrt{3}} = \frac{2\sqrt{2} \sqrt{3}}{\sqrt{3} \sqrt{3}} = \frac{2\sqrt{6}}{3}$

18. $\frac{\sqrt{5} \sqrt{2}}{\sqrt{2} \sqrt{2}} = \frac{\sqrt{10}}{2}$

19. $\frac{\sqrt{1}}{\sqrt{12}} = \frac{1}{2\sqrt{3}}$

$\frac{1 \sqrt{3}}{2\sqrt{3} \sqrt{3}} = \frac{\sqrt{3}}{6}$

20. $\frac{\sqrt{9}}{\sqrt{13}} = \frac{3\sqrt{3}}{\sqrt{13} \sqrt{13}} = \frac{3\sqrt{3}}{13}$

21. $\frac{\sqrt{25}}{\sqrt{8}} = \frac{5}{2\sqrt{2}} = \frac{5\sqrt{2}}{4}$

22. $\frac{3\sqrt{3} \sqrt{2}}{\sqrt{2} \sqrt{2}} = \frac{3\sqrt{6}}{2}$

23. $\frac{7\sqrt{7} \sqrt{5}}{\sqrt{5} \sqrt{5}} = \frac{7\sqrt{35}}{5}$

Simplify each fraction. Show work.

24. $\frac{4 \pm \sqrt{12}}{2} = \frac{4 \pm 2\sqrt{3}}{2} = 2 \pm \sqrt{3}$

25. $\frac{5 \pm \sqrt{75}}{5} = \frac{5 \pm 5\sqrt{3}}{5} = 1 \pm \sqrt{3}$

26. $\frac{6 \pm \sqrt{36}}{2} = \frac{6 \pm 6}{2} = 6, 0$

27. $\frac{-3 \pm \sqrt{24}}{12} = \frac{-3 \pm 2\sqrt{6}}{12} = -\frac{1}{4} \pm \frac{\sqrt{6}}{6}$

24
3 8
2 2

Practice the Skills

For Exercises 11-36, use the square root property to solve each equation.

$$11. \sqrt{x^2} = \sqrt{81}$$

$$x = \pm 9$$

$$13. x^2 - 25 = 0$$

$$\sqrt{x^2} = \sqrt{25}$$

$$x = \pm 5$$

$$14. x^2 - 49 = 0$$

$$\sqrt{x^2} = \sqrt{49}$$

$$x = \pm 7$$

$$15. x^2 + 49 = 0$$

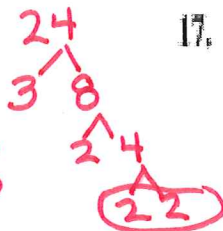
$$\sqrt{x^2} = \sqrt{-49}$$

NO SOL.

$$16. x^2 - 24 = 0$$

$$\sqrt{x^2} = \sqrt{24}$$

$$x = \pm 2\sqrt{6}$$



$$17. x^2 + 24 = 0$$

$$\sqrt{x^2} = \sqrt{-24}$$

No Sol.

$$20. \sqrt{(x-3)^2} = \sqrt{49}$$

$$\sqrt{(x-3)(x-3)}$$

$$x-3 = \pm 7$$

$$x = 3+7 = 10$$

$$x = 3-7 = -4$$

$$21. \sqrt{(p-4)^2} = \sqrt{16}$$

$$p-4 = \pm 4$$

$$p = 4 \pm 4$$

$$8, 0$$

$$22. \sqrt{(x+3)^2} = \sqrt{49}$$

$$x+3 = \pm 7$$

$$x = -3+7 = 4$$

$$x = -3-7 = -10$$

$$24. \sqrt{(a-3)^2} = \sqrt{45}$$

$$a-3 = \pm 3\sqrt{5}$$

$$a = 3 \pm 3\sqrt{5}$$



$$30. \sqrt{(x-0.2)^2} = \sqrt{0.64}$$

$$x-0.2 = \pm 0.8$$

$$x = 0.2 + 0.8 = 1.0$$

$$x = 0.2 - 0.8 = -0.6$$

$$31. \sqrt{(x+0.8)^2} = \sqrt{0.81}$$

$$x+0.8 = \pm 0.9$$

$$x = -0.8 \pm 0.9$$

$$x = 0.1$$

$$x = -1.7$$

$$32. \sqrt{\left(x + \frac{1}{2}\right)^2} = \sqrt{\frac{16}{9}}$$

$$x + \frac{1}{2} = \pm \frac{4}{3}$$

$$x = -\frac{1}{2} + \frac{4}{3} = \frac{5}{6}$$

$$-\frac{1}{2} - \frac{4}{3} = -\frac{11}{6}$$

$$33. \sqrt{(2a-5)^2} = \sqrt{18}$$

$$2a-5 = \pm 3\sqrt{2}$$

$$\frac{2a}{2} = \frac{5 \pm 3\sqrt{2}}{2}$$

$$a = \frac{5 \pm 3\sqrt{2}}{2}$$

$$\frac{5}{2} \pm \frac{3\sqrt{2}}{2}$$

$$34. \sqrt{(4y+1)^2} = \sqrt{12}$$

$$4y+1 = \pm 2\sqrt{3}$$

$$4y = -1 \pm 2\sqrt{3}$$

$$\frac{4y}{4} = \frac{-1 \pm 2\sqrt{3}}{4}$$

$$y = \frac{-1 \pm 2\sqrt{3}}{4}$$