

CIRCLE ANSWERS

Express all answers in simplest radical form. Reduce all fractions.
Show all work as necessary on this test or on separate paper.

1. $\sqrt{49} =$

2. $\sqrt[3]{27} =$

3. $\sqrt{x^{12}} =$

4. $\sqrt[3]{x^{12}} =$

5. $\sqrt{54} =$

6. $\sqrt[3]{54} =$

7. $\sqrt{60} =$

8. $\sqrt{98} =$

9. $\sqrt{12x^4y^7} =$

10. $\sqrt[3]{40x^4y^{11}} =$

11. $\sqrt{24} + \sqrt{300}$

12. $9\sqrt{24} - 2\sqrt{54} + 3\sqrt{20}$

13. $\sqrt{3x} \cdot \sqrt{5x^3}$

14. $\sqrt{12} \cdot 5\sqrt{45}$

15. $(\sqrt{3} + 2\sqrt{5})^2$

16. $(3 + \sqrt{7})(4 - \sqrt{7})$

17. $(5\sqrt{2} - 6\sqrt{6})(5\sqrt{2} - 2\sqrt{6})$

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

19. $\frac{9\sqrt{6}}{12}$

20. $\frac{20 - 8\sqrt{2}}{20}$

21. $\frac{8 + \sqrt{8}}{8}$

22. $\frac{5\sqrt{8} - 6\sqrt{50}}{10}$

23-30, rationalize all denominators and simplify:

23. $\frac{12}{\sqrt{6}} =$

24. $\frac{12}{\sqrt{8}} =$

25. $\frac{8}{\sqrt{80}} =$

26. $\sqrt{\frac{3}{4}} =$

27. $\sqrt{\frac{6}{16}} =$

28. $\sqrt{\frac{10}{32}} =$

29. $\sqrt{\frac{5x}{2y}} =$

30. $\frac{5x}{\sqrt{2y}} =$

CIRCLE ANSWERS

Express all answers in simplest radical form. Reduce all fractions.
Show all work as necessary on this test or on separate paper.

$$1. \sqrt{49} = 7$$

$$2. \sqrt[3]{27} = 3$$

$$3. \sqrt{x^{12}} = x^6$$

$$4. \sqrt[3]{x^{12}} = x^4$$

$$5. \sqrt{54} = \sqrt{9} \sqrt{6} = 3\sqrt{6}$$

$$6. \sqrt[3]{54} = \sqrt[3]{27} \sqrt[3]{2} = 3\sqrt[3]{2}$$

$$7. \sqrt{60} = \sqrt{4} \sqrt{15} = 2\sqrt{15}$$

$$8. \sqrt{98} = \sqrt{49} \sqrt{2} = 7\sqrt{2}$$

$$9. \sqrt{12x^4y^7} = \sqrt{4x^4y^6} \sqrt{3y} = 2x^2y^3\sqrt{3y}$$

$$10. \sqrt[3]{40x^4y^{11}} = \sqrt[3]{8x^3y^9} \sqrt[3]{5xy^2} = 2xy^3\sqrt[3]{5xy^2}$$

$$11. \sqrt{24} + \sqrt{300} = \sqrt{4} \sqrt{6} + \sqrt{100} \sqrt{3} = 2\sqrt{6} + 10\sqrt{3}$$

$$12. 9\sqrt{24} - 2\sqrt{54} + 3\sqrt{2} = 9\sqrt{4} \sqrt{6} - 2\sqrt{9} \sqrt{6} + 3\sqrt{4} \sqrt{6} = 9 \cdot 2\sqrt{6} - 2 \cdot 3\sqrt{6} + 3 \cdot 2\sqrt{6} = 18\sqrt{6} - 6\sqrt{6} + 6\sqrt{6} = 12\sqrt{6} + 6\sqrt{6}$$

$$13. \sqrt{3x} \cdot \sqrt{5x^3} = \sqrt{15x^4} = \sqrt{15} \sqrt{x^4} = x^2\sqrt{15}$$

$$14. \sqrt{12} \cdot 5\sqrt{45} = \sqrt{4} \sqrt{3} \cdot 5\sqrt{9} \sqrt{5} = 2\sqrt{3} \cdot 5 \cdot 3\sqrt{5} = 30\sqrt{15}$$

$$15. (\sqrt{3} + 2\sqrt{5})(\sqrt{3} + 2\sqrt{5}) = 3 + 2\sqrt{15} + 2\sqrt{15} + 4 \cdot 5 = 23 + 4\sqrt{15}$$

$$16. (3 + \sqrt{7})(4 - \sqrt{7}) = 12 - 3\sqrt{7} + 4\sqrt{7} - 7 = 5 + \sqrt{7}$$

$$17. (5\sqrt{2} - 6\sqrt{6})(5\sqrt{2} - 2\sqrt{6}) = 25 \cdot 2 - 10\sqrt{12} - 30\sqrt{12} + 12 \cdot 6 = 50 - 40\sqrt{12} + 72 = 122 - 40\sqrt{4} \sqrt{3} = 122 - 40 \cdot 2\sqrt{3} = 122 - 80\sqrt{3}$$

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

$$19. \frac{3\sqrt{6}}{4}$$

$$20. \frac{20 - 8\sqrt{2}}{20}$$

$$\frac{4(5 - 2\sqrt{2})}{20}$$

$$\frac{5 - 2\sqrt{2}}{5}$$

$$21. \frac{8 + \sqrt{8}}{8}$$

$$22. \frac{5\sqrt{8} - 6\sqrt{50}}{10}$$

$$\frac{8 + 2\sqrt{2}}{8}$$

$$\frac{2(4 + \sqrt{2})}{8} = \frac{4 + \sqrt{2}}{4}$$

$$\frac{5 \cdot 2\sqrt{2} - 6 \cdot 5\sqrt{2}}{10}$$

$$\frac{10\sqrt{2} - 30\sqrt{2}}{10} = \frac{-20\sqrt{2}}{10} = -2\sqrt{2}$$

23-30, rationalize all denominators and simplify:

$$23. \frac{12\sqrt{6}}{\sqrt{6}\sqrt{6}} = \frac{12\sqrt{6}}{6}$$

$$= 2\sqrt{6}$$

$$24. \frac{12}{\sqrt{8}} = \frac{12\sqrt{2}}{2\sqrt{2}\sqrt{2}}$$

$$= \frac{12\sqrt{2}}{4}$$

$$= 3\sqrt{2}$$

$$25. \frac{8}{\sqrt{80}} = \frac{8 \cdot \sqrt{5}}{\sqrt{16} \cdot \sqrt{5} \sqrt{5}}$$

$$= \frac{8\sqrt{5}}{4 \cdot 5}$$

$$= \frac{2\sqrt{5}}{5}$$

$$26. \sqrt{\frac{3}{4}} = \frac{\sqrt{3}}{\sqrt{4}}$$

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

$$27. \sqrt{\frac{6}{16}} = \frac{\sqrt{6}}{\sqrt{16}}$$

$$= \frac{\sqrt{6}}{4}$$

$$28. \sqrt{\frac{10}{32}} = \sqrt{\frac{5}{16}}$$

$$= \frac{\sqrt{5}}{4}$$

$$29. \sqrt{\frac{5x}{2y}} = \frac{\sqrt{5x} \sqrt{2y}}{\sqrt{2y} \cdot \sqrt{2y}}$$

$$= \frac{\sqrt{10xy}}{2y}$$

$$30. \frac{5x\sqrt{2y}}{\sqrt{2y}\sqrt{2y}} = \frac{5x\sqrt{2y}}{2y}$$