

Numbers and Their Application to Math and Science

Homework for Numbers Lesson 10

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Simplifying Square Roots

$$\sqrt{75} = \sqrt{25 \cdot 3} = \sqrt{25} \cdot \sqrt{3} = 5\sqrt{3}$$

$$\sqrt{76} = \sqrt{4 \cdot 19} = \sqrt{4}\sqrt{19} = 2\sqrt{19}$$

$$\sqrt{144} = \sqrt{9 \cdot 16} = \sqrt{9}\sqrt{16} = 3 \cdot 4 = 12$$

$$\sqrt{54} = \sqrt{9 \cdot 6} = \sqrt{9}\sqrt{6} = 3\sqrt{6} \text{ not } 3\sqrt{2}\sqrt{3}$$

Multiplying Square Roots

$$(\sqrt{3})(\sqrt{2}) = (\sqrt{6})$$

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

$$(2\sqrt{3})^2 = (2\sqrt{3})(2\sqrt{3}) = 4 \cdot 3 = 12$$

Rationalizing the Denominator

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

$$\sqrt{\frac{3}{8}} = \frac{\sqrt{3}}{\sqrt{8}} = \frac{\sqrt{3}}{\sqrt{8}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{6}}{\sqrt{16}} = \frac{\sqrt{6}}{4}$$

Express each square root EXACTLY in simplest form.

1. $\sqrt{12}$

2. $\sqrt{18}$

3. $\sqrt{24}$

4. $\sqrt{32}$

5. $\sqrt{40}$

6. $\sqrt{48}$

7. $\sqrt{60}$

8. $\sqrt{75}$

9. $\sqrt{73}$

10. $\sqrt{95}$

11. $\sqrt{90}$

12. $\sqrt{216}$

13. $\sqrt{120}$

14. $\sqrt{235}$

15. $\sqrt{810}$

16. $\sqrt{324}$

17. $\sqrt{720}$

18. $\sqrt{242}$

19. $\sqrt{784}$

20. $\sqrt{828}$

Express each product EXACTLY in simplest form.

21. $(3\sqrt{2})^2$

22. $(4\sqrt{3})^2$

23. $(2\sqrt{3})(\sqrt{2})$

24. $(3\sqrt{6})(2\sqrt{3})$

25. $(7\sqrt{3})^2$

Rationalize the denominator, then simplify EXACTLY.

26. $\sqrt{\frac{1}{3}}$

27. $\sqrt{\frac{5}{24}}$

28. $\sqrt{\frac{7}{27}}$

29. $\sqrt{\frac{35}{50}}$

30. $\sqrt{\frac{1}{2}}$

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