

SHOW ALL WORK AS NECESSARY ON THIS TEST OR ON SEPARATE PAPER.
CALCULATORS ARE REQUIRED ON THIS TEST. SIMPLIFY ALL RADICALS
COMPLETELY.

1. $\sqrt{16}$

2. $\sqrt{100x^{10}}$

3. $\sqrt{24}$

4. $\sqrt{90}$

5. $\sqrt{98}$

6. $\sqrt{300}$

7. $\sqrt{72}$

8. $\sqrt{48}$

9. $\sqrt{20x^4}$

10. $\sqrt{50x^6y^5}$

11. $\sqrt{75x^7}$

12. $\sqrt{250x^{20}}$

13. $\sqrt{63x^{15}y^8}$

14. $\sqrt{175x^{13}y^9}$

15. $\sqrt{144x^{12}y}$

16. $\sqrt{28x^3y^{25}}$

17. $\sqrt[3]{125}$

18. $\sqrt[3]{64x^6}$

19. $\sqrt[3]{72}$

20. $\sqrt[3]{54}$

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

22. $\sqrt{8} + \sqrt{18}$

23. $\sqrt{75} + \sqrt{3}$

24. $6\sqrt{40} + 5\sqrt{90}$

25. $12\sqrt{20} - 9\sqrt{12} - 5\sqrt{45}$

26. Give the calculator value of $6\sqrt{40} + 5\sqrt{90}$ (round to nearest hundredth).

27. Give the calculator value of $12\sqrt{20} - 9\sqrt{12} - 5\sqrt{45}$ (round to nearest hundredth).

28. $\sqrt{3} \cdot \sqrt{3}$

29. $4\sqrt{5} \cdot 3\sqrt{30}$

30. $3\sqrt{14} \cdot 5\sqrt{77}$

31. $5\sqrt{7}(6\sqrt{2} + 2\sqrt{5})$

32. $4\sqrt{6}(2\sqrt{6} - 5\sqrt{3})$

33. $(6 - \sqrt{6})(6 + \sqrt{6})$

34. $(12 - \sqrt{6})(2 - \sqrt{6})$

35. $(\sqrt{2} + \sqrt{10})(\sqrt{2} + \sqrt{6})$

36. $(6\sqrt{3} - 5\sqrt{6})(2\sqrt{3} - 8\sqrt{6})$

37. $(\sqrt{6} - \sqrt{3})^2$

38. $(8\sqrt{6} + 5\sqrt{15})^2$

39. Calculate the value of $(8\sqrt{6} + 5\sqrt{15})^2$ rounded to the nearest hundredth.

BASIC ALGEBRA EXAM 5P* Solutions

1. $\sqrt{16} = 4$ 2. $\sqrt{100x^{10}} = 10x^5$ 3. $\sqrt{24} = \sqrt{4 \cdot 6} = 2\sqrt{6}$ 4. $\sqrt{90} = \sqrt{9 \cdot 10} = 3\sqrt{10}$ 5. $\sqrt{98} = \sqrt{49 \cdot 2} = 7\sqrt{2}$
6. $\sqrt{300} = \sqrt{100 \cdot 3} = 10\sqrt{3}$ 7. $\sqrt{72} = \sqrt{36 \cdot 2} = 6\sqrt{2}$ 8. $\sqrt{48} = \sqrt{16 \cdot 3} = 4\sqrt{3}$ 9. $\sqrt{20x^4} = \sqrt{4x^4 \cdot 5} = 2x^2\sqrt{5}$
10. $\sqrt{50x^6y^5} = \sqrt{25x^6y^4 \cdot 2y} = 5x^3y^2\sqrt{2y}$ 11. $\sqrt{75x^7} = \sqrt{25x^6 \cdot 3x} = 5x^3\sqrt{3x}$ 12. $\sqrt{250x^{20}} = \sqrt{25x^{20} \cdot 10} = 5x^{10}\sqrt{10}$ 13. $\sqrt{63x^{15}y^8} = \sqrt{9x^{14}y^8 \cdot 7x} = 3x^7y^4\sqrt{7x}$ 14. $\sqrt{175x^{13}y^9} = \sqrt{25x^{12}y^8 \cdot 7xy} = 5x^6y^4\sqrt{7xy}$
15. $\sqrt{144x^{12}y} = \sqrt{144x^{12} \cdot y} = 12x^6\sqrt{y}$ 16. $\sqrt{28x^3y^{25}} = \sqrt{4x^2y^{24} \cdot 7xy} = 2xy^{12}\sqrt{7xy}$ 17. $\sqrt[3]{125} = 5$ 18. $\sqrt[3]{64x^6} = 4x^2$ 19. $\sqrt[3]{72} = \sqrt[3]{8 \cdot 9} = 2\sqrt[3]{9}$
20. $\sqrt[3]{54} = \sqrt[3]{27 \cdot 2} = 3\sqrt[3]{2}$ 21. $\sqrt{3} + \sqrt{3} = 2\sqrt{3}$ 22. $\sqrt{8} + \sqrt{18} = \sqrt{4 \cdot 2} + \sqrt{9 \cdot 2} = 2\sqrt{2} + 3\sqrt{2} = 5\sqrt{2}$ 23. $\sqrt{75} + \sqrt{3} = \sqrt{25 \cdot 3} + \sqrt{3} = 5\sqrt{3} + \sqrt{3} = 6\sqrt{3}$ 24. $6\sqrt{40} + 5\sqrt{90} = 6\sqrt{4 \cdot 10} + 5\sqrt{9 \cdot 10} = 6 \cdot 2\sqrt{10} + 5 \cdot 3\sqrt{10} = 12\sqrt{10} + 15\sqrt{10} = 27\sqrt{10}$
25. $12\sqrt{20} - 9\sqrt{12} - 5\sqrt{45} = 12\sqrt{4 \cdot 5} - 9\sqrt{4 \cdot 3} - 5\sqrt{9 \cdot 5} = 12 \cdot 2\sqrt{5} - 9 \cdot 2\sqrt{3} - 5 \cdot 3\sqrt{5} = 24\sqrt{5} - 18\sqrt{3} - 15\sqrt{5} = 9\sqrt{5} - 18\sqrt{3} \approx -11.0523$ 26. 85.38 27. -11.05 28. $\sqrt{3}\sqrt{3} = \sqrt{9} = 3$ 29. $4\sqrt{5} \cdot 3\sqrt{30} = 12\sqrt{150} = 12\sqrt{25 \cdot 6} = 12 \cdot 5\sqrt{6} = 60\sqrt{6}$ 30. $3\sqrt{4} \cdot 5\sqrt{11} = 15\sqrt{7 \cdot 2 \cdot 7 \cdot 11} = 15 \cdot 7\sqrt{22} = 105\sqrt{22} \approx 492.4956$
31. $5\sqrt{7}(6\sqrt{2} + 2\sqrt{5}) = 30\sqrt{14} + 10\sqrt{35}$ 32. $4\sqrt{6}(2\sqrt{6} - 5\sqrt{3}) = 8 \cdot 6 - 20\sqrt{18} = 48 - 20\sqrt{9 \cdot 2} = 48 - 60\sqrt{2} \approx -36.8528$ 33. $(6 - \sqrt{6})(6 + \sqrt{6}) = 36 + 6\sqrt{6} - 6\sqrt{6} - 6 = 30$ 34. $(12 - \sqrt{6})(2 - \sqrt{6}) = 24 - 14\sqrt{6} + 6 = 30 - 14\sqrt{6} \approx -4.292856$

NOTE: On radical problems involving only numbers, I recommend that you use your calculator to calculate the value of the problem and the value of your answer. If the answers do not agree, then you need to find the error! What a GREAT strategy for a test!! Find errors BEFORE turning in test!

$$\begin{aligned}
35. & (\sqrt{2} + \sqrt{10})(\sqrt{2} + \sqrt{6}) \\
&= 2 + \sqrt{2} + \sqrt{20} + \sqrt{60} \\
&= 2 + \sqrt{4}\sqrt{3} + \sqrt{4}\sqrt{5} + \sqrt{4}\sqrt{15} \\
&= \underline{2 + 2\sqrt{3} + 2\sqrt{5} + 2\sqrt{15}} \\
&\approx 17.6822
\end{aligned}$$

$$\begin{aligned}
36. & (6\sqrt{3} - 5\sqrt{6})(2\sqrt{3} - 8\sqrt{6}) \\
&= 12 \cdot 3 - 48\sqrt{18} - 10\sqrt{18} + 40 \cdot 6 \\
&= 36 - 58\sqrt{18} + 240 \\
&= 276 - 58\sqrt{9}\sqrt{2} \\
&= 276 - 58 \cdot 3\sqrt{2} \\
&= \underline{276 - 174\sqrt{2}} \approx 29.9268
\end{aligned}$$

$$\begin{aligned}
37. & (\sqrt{6} - \sqrt{3})(\sqrt{6} - \sqrt{3}) \\
&= 6 - \sqrt{18} - \sqrt{18} + 3 \\
&= 9 - 2\sqrt{18} \\
&= 9 - 2\sqrt{9}\sqrt{2} \\
&= \underline{9 - 6\sqrt{2}} \\
&\approx 1.5147
\end{aligned}$$

$$\begin{aligned}
38. & (8\sqrt{6} + 5\sqrt{15})(8\sqrt{6} + 5\sqrt{15}) \\
&= 64 \cdot 6 + 40\sqrt{90} + 40\sqrt{90} + 25 \cdot 15 \\
&= 384 + 80\sqrt{90} + 375 \\
&= 759 + 80 \cdot \sqrt{9} \cdot \sqrt{10} \\
&= 759 + 80 \cdot 3\sqrt{10} \\
&= \underline{759 + 240\sqrt{10}}
\end{aligned}$$

$$39. \approx \underline{1517.95}$$