

Study Guide for Final

Simplify.

1) $6\sqrt{45}$

$$\begin{array}{l} \swarrow \quad \searrow \\ 3 \cdot 3 \cdot 5 \\ \hline 6 \cdot 3 \sqrt{5} \\ \hline 18\sqrt{5} \end{array}$$

2) $2\sqrt{343}$

$$\begin{array}{l} \swarrow \quad \searrow \quad \searrow \\ 7 \cdot 7 \cdot 7 \\ \hline 2 \cdot 7 \sqrt{7} \\ \hline 14\sqrt{7} \end{array}$$

3) $-5\sqrt{128n^4}$

$$\begin{array}{l} \swarrow \quad \swarrow \quad \swarrow \quad \swarrow \quad \swarrow \quad \swarrow \quad \swarrow \quad \swarrow \\ 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot n \cdot n \cdot n \cdot n \\ \hline -5 \cdot 2 \cdot 2 \cdot 2 \cdot n \cdot n \sqrt{2} \\ \hline -40n^2\sqrt{2} \end{array}$$

4) $3\sqrt{18x}$

$$\begin{array}{l} \swarrow \quad \swarrow \quad \swarrow \quad \swarrow \\ 3 \cdot 3 \cdot 2 \cdot x \\ \hline 3 \cdot 3 \sqrt{2x} \\ \hline 9\sqrt{2x} \end{array}$$

5) $\sqrt{2}(\sqrt{6} + \sqrt{2})$

$$\begin{array}{l} \sqrt{12} + \sqrt{4} \\ \hline 2\sqrt{3} + 2 \end{array}$$

6) $\sqrt{6}(-5\sqrt{10} - 2\sqrt{2})$

$$\begin{array}{l} -5\sqrt{60} - 2\sqrt{12} \\ -5 \cdot 2\sqrt{15} - 2 \cdot 2\sqrt{3} \\ \hline -10\sqrt{15} - 4\sqrt{3} \end{array}$$

7) $2\sqrt{6} - 2\sqrt{18} - \sqrt{54}$

$$\begin{array}{l} 2\sqrt{6} - 6\sqrt{2} - 3\sqrt{6} \\ \hline -6\sqrt{2} - 1\sqrt{6} \end{array}$$

8) $2\sqrt{2} - \sqrt{8} - \sqrt{2}$

$$\begin{array}{l} 2\sqrt{2} - 2\sqrt{2} - \sqrt{2} \\ \hline = -\sqrt{2} \end{array}$$

9) $\frac{3\sqrt{3} \cdot \sqrt{75}}{\sqrt{75} \cdot \sqrt{75}} = \frac{3\sqrt{225}}{75} = \frac{3 \cdot 15}{75} = \frac{45}{75}$

$$\boxed{= \frac{3}{5}}$$

10) $\frac{4\sqrt{20} \cdot \sqrt{125}}{\sqrt{125} \cdot \sqrt{125}} = \frac{4\sqrt{2500}}{125} = \frac{4 \cdot 50}{125} = \frac{200}{125} = \frac{8}{5}$

$$11) \frac{\sqrt{4} \cdot \sqrt{3}}{\sqrt{3} \cdot \sqrt{3}} = \boxed{\frac{2\sqrt{3}}{3}}$$

$$12) \frac{4 \cdot \sqrt{3}}{\sqrt{3} \cdot \sqrt{3}} = \boxed{\frac{4\sqrt{3}}{3}}$$

Factor each completely.

$$13) x^2 + 3x - 28$$

$$(x+7)(x-4)$$

$$14) \frac{3x^2 - 21x}{3x \cdot 3x}$$

$$3x(x-7)$$

$$15) m^2 - 11m + 18$$

$$(m-9)(m-2)$$

$$16) \frac{6n^3 - 6n^2 - 336n}{6n \cdot 6n \cdot 6n}$$

$$6n(n^2 - n - 56)$$

$$\boxed{6n(n-8)(n+7)}$$

$$17) 7x^2 + 45x - 28$$

$$(x+49)(x-4)$$

$$\boxed{(x+7)(7x-4)}$$

$$18) 5v^2 - 38v + 48$$

$$(v-8)(v-30)$$

$$\boxed{(5v-8)(v-6)}$$

$$19) 5p^2 + 42p + 16$$

$$(p+40)(p+2)$$

$$\boxed{(p+8)(5p+2)}$$

$$20) 5n^2 - 7n - 24$$

$$(n-15)(n+8)$$

$$\boxed{(n-3)(5n+8)}$$