

**Factor**

1.  $x^2 + 3x + 2$

2.  $x^2 - x - 2$

3.  $x^2 + x - 6$

4.  $a^2 + a - 12$

5.  $a^2 - 2a - 35$

6.  $b^2 + 8b + 16$

7.  $b^2 + 7b - 8$

8.  $y^2 - y - 6$

9.  $x^2 - 4x - 45$

10.  $y^2 - 8y + 15$

**Factor**

1.  $2x^2 + 6x + 4$

6.  $a^3 - 5a^2 + 4a$

2.  $4a^2 - 12a + 8$

7.  $x^4 - 15x^3 + 56x^2$

3.  $10a^2 + 10a - 20$

8.  $b^4 - 3b^3 - 10b^2$

4.  $7a^2 - 14a - 21$

9.  $2a^3 + 8a^2 - 64a$

5.  $3y^2 - 15y + 18$

10.  $3a^3 - 9a^2 - 54a$

**Factor**

1.  $2x^2 + 3x + 1$

6.  $3p^2 - 16p + 5$

2.  $2y^2 + 7y + 3$

7.  $12y^2 - 7y + 1$

3.  $2b^2 - 11b + 5$

8.  $2t^2 + 5t - 12$

4.  $3b^2 - 13b + 4$

9.  $5y^2 - 22y + 8$

5.  $2t^2 - t - 10$

10.  $3p^2 + 22p - 16$

**Factor**

1.  $x^2 - 25$

6.  $x^2 - 6x + 9$

2.  $x^2 - 100$

7.  $y^2 + 14y + 49$

3.  $9x^2 - 1$

8.  $5a^2 - 20a - 25$

4.  $64x^2 - 9$

9.  $2x^2 - 72$

5.  $36y^2 + 49$

10.  $4x^2 - 16$

**Simplify**

1.  $\sqrt{125n}$

2.  $\sqrt{512k^2}$

3.  $\sqrt{216v}$

4.  $\sqrt{48k^2}$

5.  $\sqrt{216k^4}$

6.  $\sqrt{512m^3}$

7.  $\sqrt{80p^3}$

8.  $\sqrt{100v^3}$

$$9. \sqrt{147m^3n^3}$$

$$10. \sqrt{45p^2}$$

$$11. \sqrt{16u^4v^3}$$

$$12. \sqrt{64m^3n^3}$$

$$13. \sqrt{75x^2y}$$

$$14. \sqrt{28x^3y^3}$$

**Divide and rationalize the denominator:**

1.  $\frac{2}{\sqrt{3}}$

10.  $\frac{\sqrt{5}-\sqrt{3}}{\sqrt{5}+\sqrt{3}}$

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

11.  $\frac{3}{4+\sqrt{5}}$

3.  $\frac{5}{3\sqrt{7}}$

12.  $\frac{5}{\sqrt{7}+4}$

4.  $-\frac{21}{10\sqrt{3}}$

13.  $\frac{2\sqrt{7}}{4+\sqrt{5}}$

5.  $\frac{5}{6+\sqrt{3}}$

14.  $\frac{4\sqrt{5}}{-4+\sqrt{5}}$

6.  $\frac{3\sqrt{5}}{9-\sqrt{5}}$

15.  $\frac{\sqrt{2}+\sqrt{3}}{\sqrt{2}-\sqrt{3}}$

7.  $\frac{3}{3-\sqrt{3}}$

16.  $\frac{\sqrt{15}+\sqrt{6}}{\sqrt{15}-\sqrt{6}}$

8.  $\frac{12}{4-\sqrt{2}}$

17.  $\frac{2}{3-\sqrt{3x^2}}$

9.  $\frac{1}{3\sqrt{2}}$

18.  $\frac{3}{-4k^2-5\sqrt{k^3}}$

**Identify the error in the following questions.**

1.  $\frac{\sqrt{4}}{4\sqrt{5}}$

$$\frac{\sqrt{4}}{4\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \frac{\sqrt{20}}{4\sqrt{25}} = \frac{4\sqrt{5}}{20} = \frac{\sqrt{5}}{5}$$

2.  $\frac{\sqrt{5}}{5+\sqrt{2}}$

$$\frac{\sqrt{5}}{5+\sqrt{2}} \cdot \frac{5+\sqrt{2}}{5+\sqrt{2}} = \frac{5\sqrt{5}+\sqrt{10}}{27}$$

3.  $\frac{2}{3-\sqrt{3x^2}}$

$$\frac{2}{3-\sqrt{3x^2}} \cdot \frac{3+\sqrt{3x^2}}{3+\sqrt{3x^2}} = \frac{6+\sqrt{3x^2}}{9-3x^2}$$

4.  $\frac{-4+\sqrt{3}}{-1-2\sqrt{5}}$

$$\frac{-4+\sqrt{3}}{-1-2\sqrt{5}} \cdot \frac{-1+2\sqrt{5}}{-1+2\sqrt{5}} = \frac{4+2\sqrt{15}}{-19}$$

**Solve for the variable.**

1)  $-20 = -4x - 6x$

6)  $3n - 5 = -8(6 + 5n)$

2)  $6 = 1 - 2n + 5$

7)  $-(1 + 7x) - 6(-7 - x) = 36$

3)  $8x - 2 = -9 + 7x$

8)  $-3(4x + 3) + 4(6x + 1) = 43$

4)  $a + 5 = -5a + 5$

9)  $27a - 22 = -4(1 - 6a)$

5)  $2(4x - 3) - 8 = 4 + 2x$

10)  $-5(1 - 5x) + 5(-8x - 2) = -4x - 8x$

**Solve for the variable**

1)  $2n^3 - n^2 - 136n = 0$

6)  $2r^5 - 6r^4 - 56r^3 = 0$

2)  $5x^3 + 4x^2 - 57x = 0$

7)  $12b^3 - 2b^2 - 30b = 0$

3)  $6n^4 + 9n^3 + 3n^2 = 0$

8)  $4r^4 - 64r^2 = 0$

4)  $2n^3 + 24n^2 - 56n = 0$

9)  $12b^3 + 6b^2 = 18b$

5)  $x^3 - x = 0$

10)  $6v^3 - 42v = -4v^2$

**Identify the error in the following questions.**

1.  $x^3 + 5x^2 = 3x + 45$

$$6x^2 = 3x + 45$$

$$6x^2 - 3x - 45 = 0$$

$$3(2x^2 - x - 15) = 0$$

$$3(x - 3)(2x + 5) = 0$$

$$x = 3, -5/2$$

2.  $6x^3 - 16x = 4x^2$

$$6x^3 - 4x^2 - 16x = 0$$

$$2x(3x^2 - 2x - 4) = 0$$

$$2x(3x + 4)(x - 2) = 0$$

$$x = 2, 0, -4$$

3.  $3x^2(3x + 4) = 12x(x + 3)$

$$9x^3 + 12x^2 = 12x^2 + 36x$$

$$9x^3 - 36x = 0$$

$$9x(x^2 - 4) = 0$$

$$x = 0, 4$$