

Key

Factoring Review

Factoring out the Greatest Common Factor

1. $18x^3 + 27x^2$

$$9x^2(2x+3)$$

2. $x^2(x+3) + 5(x+3)$

$$(x^2+5)(x+3)$$

3. $10x^3 - 4x^2$

$$2x^2(5x-2)$$

4. $2x(x-7) + 3(x-7)$

$$(x-7)(2x+3)$$

5. $9x^4 - 18x^3 + 36x^2$

$$9x^2(x^2-2x+4)$$

6. $x^2(2x+5) + 17(2x+5)$

$$(x^2+17)(2x+5)$$

Factoring by Grouping

7. $x^3 + 4x^2 + 3x + 12$

$$x^2(x+4) + 3(x+4)$$

$$(x^2+3)(x+4)$$

8. $x^3 + 5x^2 - 2x - 10$

$$x^2(x+5) - 2(x+5)$$

$$(x^2-2)(x+5)$$

9. $x^3 - 2x^2 + 5x - 10$

$$x^2(x-2) + 5(x-2)$$

$$(x^2+5)(x-2)$$

10. $3x^3 - 2x^2 - 6x + 4$

$$x^2(3x-2) - 2(3x-2)$$

$$(x^2-2)(3x-2)$$

11. $x^3 + 2x^2 - x - 2$

$$x^2(x+2) - 1(x+2)$$

$$(x^2-1)(x+2)$$

$$(x+1)(x-1)(x+2)$$

12. $x^3 - x^2 - 5x + 5$

$$x^2(x-1) - 5(x-1)$$

$$(x^2-5)(x-1)$$

Factoring Trinomials Whose Leading Coefficient Is 1

13. $x^2 + 6x + 8$

$$(x+2)(x+4)$$

14. $x^2 + 13x + 40$

$$(x+8)(x+5)$$

15. $x^2 + 3x - 18$

$$(x+6)(x-3)$$

16. $x^2 - 5x - 14$

$$(x-7)(x+2)$$

17. $x^2 - 14x + 45$

$$(x-9)(x-5)$$

18. $x^2 - 8x + 15$

$$(x-3)(x-5)$$

Factoring the Difference of Two Squares

19. $x^2 - 4$

$$(x-2)(x+2)$$

20. $81x^2 - 49$

$$(9x-7)(9x+7)$$

21. $x^2 - 81$

$$(x-9)(x+9)$$

22. $36x^2 - 25$

$$(6x-5)(6x+5)$$

23. $9x^2 - 25$

$$(3x-5)(3x+5)$$

24. $64x^2 - 121$

$$(8x-11)(8x+11)$$

Factoring the Sum or Difference of Two Cubes

$$a^3 + b^3 = (a+b)(a^2 - ab + b^2)$$

$$a^3 - b^3 = (a-b)(a^2 + ab + b^2)$$

25. $x^3 + 8$

$$a = x$$

$$b = 2$$

$$(x+2)(x^2 - 2x + 4)$$

26. $64x^3 - 125$

$$a = 4x$$

$$b = 5$$

$$(4x-5)(16x^2 + 20x + 25)$$

27. $x^3 + 1$

$$a = x$$

$$b = 1$$

$$(x+1)(x^2 - x + 1)$$

28. $125x^3 - 8$

$$a = 5x$$

$$b = 2$$

$$(5x-2)(25x^2 + 10x + 4)$$

29. $x^3 - 27$

$$a = x$$

$$b = 3$$

$$(x-3)(x^2 + 3x + 9)$$

30. $8x^3 + 125$

$$a = 2x$$

$$b = 5$$

$$(2x+5)(4x^2 - 10x + 25)$$

Exponent Review

Rewrite without negative or rational exponents.

1) $3x^{-7}$

$$\frac{3}{x^7}$$

2) a^{-11}

$$\frac{1}{a^{11}}$$

3) x^{-y}

$$\frac{1}{x^y}$$

4) $\frac{3}{2x^{-2}}$

$$\frac{3x^2}{2}$$

5) $7^{\frac{1}{2}}$

$$\sqrt{7}$$

6) $4^{\frac{4}{3}}$

$$\sqrt[3]{4^4}$$

or
 $\sqrt[3]{256}$

7) $5x^{-\frac{1}{2}}$

$$\frac{5}{x^{\frac{1}{2}}}$$

$$\left(\frac{5}{\sqrt{x}}\right)$$

8) $\frac{2x}{x^{-\frac{3}{4}}}$

$$2x \cdot x^{\frac{3}{4}}$$

$$2x^{\frac{7}{4}}$$

$$(2^4 \sqrt{7})$$

Rewrite with negative or rational exponents.

9) $\frac{3}{x^2}$

$$3x^{-2}$$

10) $\frac{10}{x}$

$$10x^{-1}$$

11) $\frac{4y}{y^4}$

$$4y^{-3}$$

12) $\frac{1}{x^4}$

$$x^{-4}$$

13) $(\sqrt{x})^3$

$$x^{\frac{3}{2}}$$

14) $5^4 \sqrt{y^5}$

$$5^4 y^{\frac{5}{4}}$$

15) $\frac{2}{\sqrt[3]{x^2}}$

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

16) $\frac{1}{\sqrt[4]{x}}$

$$x^{-\frac{1}{4}}$$

