

Factoring Review

Name _____

Date _____

Block _____

Multiply (FOIL):

1. $(2m + 5)(3m + 1)$
2. $(3r - 5)(3r - 3)$
3. $(3k - 4)(2k + 5)$
4. $(5a + b)(2a - b)$
5. $(3d - 2)(d + 3)$

Factor:

6. $x^2 - 16$
7. $b^2 - 1$
8. $p^2 - 64$
9. $144 - 49a^2$
10. $\frac{16}{81} - \frac{25}{144}a^2$

Simplify:

11. $(x + 6)^2$
12. $(3a - 4)^2$
13. $(4x + 1)^2$
14. $(4g - 5)^2$
15. $(b - 5c)^2$

Factor, if possible:

16. $a^2 + 8a + 16$
17. $y^2 - 12y + 36$
18. $u^2 + 16u + 64$
19. $16a^2 - 24a + 9$
20. $4a^2 - 30a + 25$
21. $b^2 + 9b + 14$
22. $g^2 - 4g + 3$
23. $x^2 - 2x - 24$
24. $a^2 - 2a - 8$
25. $3b^2 + 11b + 6$
26. $2p^2 - 15p + 25$

Factoring Trinomials when $a=1$

Name _____

Factor, write prime if not possible.

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

2. $x^2 - x - 6$

3. $x^2 + 5x + 6$

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

5. $x^2 - 9x + 14$

6. $x^2 + 7x - 18$

7. $x^2 - 10x + 16$

8. $x^2 + 12x + 27$

9. $x^2 + x - 56$

10. $x^2 - 14x + 24$

11. $x^2 - 4x - 12$

12. $x^2 + 13x - 36$

13. $x^2 - 4x - 32$

14. $x^2 - 13x + 36$

15. $x^2 + 21x + 54$

16. $x^2 - 3x - 40$

17. $x^2 - 22x - 75$

18. $x^2 - 9x - 36$

19. $45 + 14y + y^2$

20. $x^2 + 4x - 21$

Solve by Factoring

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Intro to Factoring: when $a=1$ OR there's a "difference of 2 squares"

FACTOR & Solve

1. $x^2 - 64 = 0$ _____

2. $x^2 + 3x - 4 = 0$ _____

3. $x^2 - 5x + 6 = 0$ _____

4. $4y^2 - 81 = 0$ _____

5. $x^2 - 16x = 36$ _____

6. $x^2 - 12x + 36 = 0$ _____

7. $-x^2 - 13x = 22$ _____

8. $x^2 - 2x - 24 = 0$ _____

9. $x^2 = -9x - 14$ _____

10. $x^2 - 2x - 8 = 0$ _____

11. $x^2 + x - 6 = 0$ _____

12. $x^2 - 8x + 15 = 0$ _____

Examples:

① $x^2 - 81 = 0$
 $(x+9)(x-9) = 0$
 $x+9=0$ $x-9=0$
 $-9 \quad -9$ $+9 \quad +9$
 $x = -9$ **$x = 9$**

② $4x^2 - 32x + 60 = 0$
 GCF $4(x^2 - 8x + 15) = 0$
 $\frac{15}{5}$ $4(x-5)(x-3) = 0$
 $x-5=0$ $x-3=0$
 $x = 5$ **$x = 3$**

③ $x^2 + 2x = 15$
 $\quad \quad -15 \quad -15$
 $x^2 + 2x - 15 = 0$
 $(x+5)(x-3) = 0$
 $x+5=0$ $x-3=0$
 $x = -5$ $x = 3$ **(F3)**

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1. Which expression is prime?

- A. $x^2 + 2x$
- B. $3x^2 + 9$
- C. $x + 1$
- D. $2x^2 + 6x - 10$

8. Which is the simplified form of $(x + 10)(x - 10)$?

- A. $x^2 + 20x + 100$
- B. $x^2 + 10x + 100$
- C. $x^2 - 100$
- D. $x^2 - 10x + 100$

Exercises 2-3 : In which case is the greatest common monomial factored out correctly?

2. $6x^3 - 9x^2 - 12x$

- A. $3x^2(6x - 9 - 12)$
- B. $3x(2x^2 - 3x - 4)$
- C. $x(6x^2 - 9x - 12)$
- D. $3(2x^3 - 3x - 4x)$

9. Factor: $7x^2 + 9x - 10$

- A. $(7x + 10)(x - 1)$
- B. $(7x - 5)(x + 2)$
- C. $(7x + 2)(x - 5)$
- D. $(7x - 1)(x + 10)$

3. $5a^2bc - 5ab^2c - 5abc$

- A. $5abc(abc)$
- B. $5abc(a - b - 5)$
- C. $5abc(a - b - 1)$
- D. $5abc(a - b - c)$

10. Factor: $2x^2 - x - 3$

- A. $(2x + 1)(x + 3)$
- B. $(2x + 3)(x - 1)$
- C. $(2x - 3)(x + 1)$
- D. $(2x - 3)(x - 1)$

4. Find the product: $(2x + 6)(x - 3)$

- A. $2x^2 + 3x - 18$
- B. $2x^2 + x - 18$
- C. $2x^2 - 18$
- D. $3x + 3$

11. Which expression is prime?

- A. $x^2 + 4x + 3$
- B. $x^2 + 5x + 6$
- C. $x^2 + 6x + 8$
- D. none of the above

5. Find the product: $(3a - 2)(5a - 5)$

- A. $15a^2 - 31a - 10$
- B. $15a^2 - 25a + 10$
- C. $15a^2 - 5a + 10$
- D. $8a^2 - 25a + 7$

12. Factor:
 $\frac{9}{16}y^2 - 36 =$

- A. $\left(\frac{9}{4}y + 4\right)\left(\frac{9}{4}y - 4\right)$
- B. $\left(6y + \frac{3}{4}\right)\left(6y - \frac{3}{4}\right)$
- C. $\left(\frac{3}{4}y + 6\right)\left(\frac{3}{4}y - 6\right)$
- D. $\left(\frac{3}{4}y + 9\right)\left(\frac{3}{4}y - 9\right)$

Exercises 6 + 12. Factor the binomial.

6. $x^2y^2 - 100 =$

- A. $10xy(-10xy)$
- B. $(x + y + 10)(x + y - 10)$
- C. $(xy - 10)(xy - 10)$
- D. $(xy + 10)(xy - 10)$

7. Simplify $(2m + 3)^2$.

- A. $2m^2 + 6m + 9$
- B. $2m^2 + 12m + 9$
- C. $4m^2 + 9$
- D. $4m^2 + 12m + 9$

- 1. _____
- 2. _____
- 3. _____
- 4. _____
- 5. _____
- 6. _____
- 7. _____
- 8. _____
- 9. _____
- 10. _____
- 11. _____
- 12. _____

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1. Which expression is prime?
- A. $x^2 + 5x + 6$
 - B. $x^2 + 7x + 12$
 - C. $x^2 + 8x + 12$
 - D. None of the above

In which case is the greatest common monomial factored out correctly?

2. $12abc^2 - 24a^2c$
- A. $12(abc^2 - 2a^2c)$
 - B. $a(12bc^2 - 24ac)$
 - C. $12ac(bc - 2a)$
 - D. $12a(bc^2 - 2ac)$
3. $30x^5y^5 - 20x^3y^9 + 10x^3y^5$
- A. $5x^3(6x^2y^5 - 4y^9 + 2y^5)$
 - B. $10(3x^5y^5 - 2x^3y^9 + x^3y^5)$
 - C. $x^3y^5(30x^2 - 20y^4 + 10)$
 - D. $10x^3y^5(3x^2 - 2y^4 + 1)$
4. Find the product: $(2x - 3)(x + 6)$
- A. $2x^2 + 3x - 18$
 - B. $2x^2 + 9x - 18$
 - C. $2x^2 - 18$
 - D. $3x + 3$
5. Find the product: $(3a + 2)(4a - 3)$
- A. $7a^2 - 8a - 1$
 - B. $12a^2 - 18a - 6$
 - C. $12a^2 - a - 6$
 - D. $12a^2 + 17a + 6$
6. Factor: $a^3 - a$
- A. $a(a^2 - 1)$
 - B. $a(a - 1)(a + 1)$
 - C. $a(a - 1)(a - 1)$
 - D. $a(a^2 + 1)$

7. Simplify: $(2x - 3)^2$
A. $2x^2 - 6x + 9$
B. $2x^2 + 12x + 9$
C. $4x^2 + 9$
D. $4x^2 - 12x + 9$
8. Which is the simplified form of $(a + b)(a - b)$?
A. $a^2 + 2ab + b^2$
B. $a^2 + ab + b^2$
C. $a^2 - b^2$
D. $a^2 - 2ab + b^2$
9. Factor: $x^2 - 7x + 12$
A. $(x - 4)(x - 3)$
B. $(x + 4)(x - 3)$
C. $(x + 4)(x + 3)$
D. $(x - 4)(x + 3)$
10. Factor: $2x^2 - x - 10$
A. $(2x + 5)(x + 2)$
B. $(2x + 5)(x - 2)$
C. $(2x - 5)(x + 2)$
D. $(2x - 5)(x - 2)$
11. Which expression is prime?
A. $x^3 + 2x$
B. $4x^2 + 8$
C. $x + 1$
D. $x^2 - 2x - 24$
12. Factor: $\frac{16}{25}y^2 - 49$
A. $\left(\frac{4}{5}y + 7\right)\left(\frac{4}{5}y - 7\right)$
B. $\left(\frac{4}{5}y - 7\right)\left(\frac{4}{5}y - 7\right)$
C. $\left(\frac{16}{5}y + 7\right)\left(\frac{16}{5}y - 7\right)$
D. $\left(7y + \frac{4}{5}\right)\left(7y - \frac{4}{5}\right)$

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Factoring

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Factor each polynomial completely. Write prime if it is not factorable.

1.) $24x^2 - 8x$ _____ 2.) $10x^2 + 35x$ _____

3.) $12x^2 - 9x + 15$ _____ 4.) $3n^3 - 12n^2 - 30n$ _____

5.) $2x^3 - 3x^2 + 5x$ _____ 6.) $17x^2 + 34x + 51$ _____

7.) $18m^2n^4 - 12m^2n^3 + 24m^2n^2$ _____

8.) $3x + 6$ _____ 9.) $4a - 12$ _____

10.) $-a^3 - 4a$ _____ 11.) $36y^4 + 24y^2$ _____

12.) $y^2 - 144$ _____ 13.) $2x^2 + 16x + 32$ _____

14.) $x^2 - 64$ _____ 15.) $x^2 + 3x - 4$ _____

16.) $x^2 - 5x + 6$ _____ 17.) $x^2 + 3x - 18$ _____

18.) $x^2 - 16x - 36$ _____ 19.) $x^2 + 13x + 22$ _____

20.) $2x^2 - x - 6$ _____ 21.) $3x^2 + 11x + 10$ _____

22.) $2x^2 - x - 21$ _____ 23.) $6x^2 + 5x - 4$ _____

24.) $6x^2 - 10x + 4$ _____ 25.) $7x^2 + 42x + 63$ _____

26.) $4x^2 - 49$ _____ 27.) $3x^2 - 108$ _____

28.) $4x^2 - 32x + 60$ _____ 29.) $3x^2 + 21x + 30$ _____

30.) $x^2 - 25$ _____ 31.) $b^2 - 9$ _____

32.) $4y^2 - 81$ _____ 33.) $100 - 169x^2$ _____

34.) $x^2 + 8x + 16$ _____ 35.) $y^2 - 12y + 36$ _____

36.) $x^2 + 16x + 64$ _____ 37.) $16x^2 - 24x + 9$ _____

38.) $4x^2 - 30x + 25$ _____ 39.) $x^2 + 9x + 14$ _____

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40.) $x^2 - 4x + 3$ _____

41.) $x^2 - 2x + 24$ _____

42.) $x^2 - 2x - 8$ _____

43.) $3x^2 + 11x + 6$ _____

44.) $2x^2 - 15x + 25$ _____

45.) $9x^2 - 1$ _____

46.) $x^3 - 64$ _____

47.) $8x^3 + 1$ _____

48.) $x^3 + 2x^2 + 4x + 8$ _____

50.) $2x^3 - 6x^2 + 3x - 9$ _____

51.) $3x^3 + 6x^2 - 2x - 4$ _____

52.) $x^4 - 16$ _____

53.) $x^4 + 2x^3 - 8x - 16$ _____

54.) $3x^3 - 3x^2 - 6x$ _____

Solve by factoring.

55.) $2x^2 = 6x$ _____

56.) $x^2 - 2x = 3$ _____

57.) $x^3 = 2x^2 + 8x$ _____

58.) $3x^2 + 5x = 2$ _____

59.) $x^3 + 3x^2 + 2x = -6$ _____

60.) $x^2 + x - 30 = 0$ _____

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