Unit 7: Factoring - Study Guide
Algebra 1

Name KEY
Date _____ Block _____

Factor each using the greatest common factor.

1. $3x^2 - 9x$

$3x(x-3)$

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

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

3. $-54x^2y + 9xy - 27xy^2$

$-9xy(6x-1+3y)$

Factor each using special patterns.

4. $x^2 - 81$

$\sqrt{x^2} = x$

$\sqrt{81} = 9$

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

5. $x^2 - 18x + 81$

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

6. $16x^2 - 121$

$\sqrt{16x^2} = 4x$

$\sqrt{121} = 11$

$(4x+11)(4x-11)$

7. $4x^2 + 12x + 9$

$x^2 + 12x + 36$

$(x+\frac{6}{4})(x+\frac{6}{4})$

$(x+\frac{3}{2})(x+\frac{3}{2})$

$(2x+3)(2x+3)$

Factor each polynomial *completely*.

8. $x^2 - 4x - 21$

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

9. $-x^2 - 12x + 45$

$-1(x^2+12x-45)$

$-1(x+15)(x-3)$

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

$x^2+10x+24$

$(x+6)(x+4)$

11. $-10x^2 - 3x + 18$

$-1(10x^2+3x-18)$

$x^2+3x-180$

$-1(x-\frac{12}{10})(x+\frac{15}{10})$

$-1(x-\frac{6}{5})(x+\frac{3}{2})$

$-1(5x-6)(2x+3)$

12. $2x^2 - 6x - 8$

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

$2(x-4)(x+1)$

13. $2x^2 - 72$

$2(x^2-36)$

$\sqrt{x^2} = x$

$\sqrt{36} = 6$

$2(x+6)(x-6)$

14. $3x^5 - 12x^3 - 48x^2$

$3x^2(x^3 - 4x - 16)$

15. $9m^2 - 24m + 16$

144, -12, -12, -24

$(m - \frac{12}{9})(m - \frac{12}{9})$

$(m - \frac{4}{3})(m - \frac{4}{3})$

$(3m - 4)(3m - 4)$

16. $a^2 - 8ab - 9b^2$

$(a - 9b)(a + 1b)$ -9, 1, -9, -8

$(a - 9b)(a + b)$

17. $2x^2 + 40x + 200$

$2(x^2 + 20x + 100)$

$2(x + 10)(x + 10)$

100, 10, 10, 20

Multiple Choice

18. Which expression shows $4x - 16$ in completely factored form?

A. $4(x + 4)$ B. $(x - 4)^2$ C. $2(2x - 8)$ D. $4(x - 4)$

$4(x - 4)$

19. Which binomial is a factor of $x^2 - 15x + 56$?

A. $x + 8$ B. $x - 8$ C. $x + 7$ D. $x - 3$

56, -8, -7, -15 $(x - 8)(x - 7)$

20. When completely factored, $6x^2 - 2x - 20$ equals:

A. $(3x - 5)(2x + 4)$ B. $(3x + 5)(2x - 4)$ C. $2(3x - 5)(x + 2)$ D. $2(3x + 5)(x - 2)$

$2(3x^2 - x - 10)$

$x^2 - x - 30$

-30, -6, 5, -1

$2(x - \frac{6}{3})(x + \frac{5}{3})$

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

21. What is the greatest common monomial factor of $32x^5 - 12x^2$?

A. $4x^2$ B. $32x^5$ C. $12x^2$ D. 4

$4x^2(8x^3 - 3)$

22. Which is the ***completely*** factored form of $15m^2 - 60$?

A. $15(m - 2)(m + 2)$
B. $15(m - 2)^2$
C. $5(3m^2 - 12)$
D. $15(m^2 - 4)$

$15(m^2 - 4)$

$\sqrt{m^2} = m$

$\sqrt{4} = 2$

$15(m+2)(m-2)$

23. Which of the following equals $x^2 - 14x - 32$ when factored completely?

A. $(x + 4)(x - 8)$
B. $(x - 4)(x - 8)$
C. $(x - 2)(x + 16)$
D. $(x + 2)(x - 16)$

-32
-16 2
-14

$(x-16)(x+2)$

24. Circle ***all*** the factors of $3x^3 + 24x^2 - 27x$.

3x (x - 1) (x - 9)

3 (x + 1) (x + 9)

$3x(x^2 + 8x - 9)$

$3x(x-1)(x+9)$

-9
-1 9
8