

MAT 0020 Basic Algebra II

KEY CONCEPT REVIEW

CHAPTER 4, SECTIONS 4.1 – 4.4

TO RECEIVE CREDIT, DO ALL PROBLEMS, MAKE CORRECTIONS, AND SHOW ALL WORK.

- 1) What is the first step in any factoring problem?
- 2) Find the GCF (greatest common factor) of the terms $12x^3$, $6x^2y$, and $18xy^2$.

Factor out the GCF from the polynomial.

- 3) $9x^2 + 36y^2$
 - A) $9(x + 2y)^2$
 - B) $9(x^2 + 4y^2)$
 - C) $(3x + 6y)(3x - 6y)$
 - D) $(3x + 6y)^2$
- 4) $27x^8y^3 + 90x^6y^5 - 36x^4y^7$
- 5) $x^9y^6 - x^8y^5 + x^7y^4 - x^6y^3$
- 6) $y^2(x + 4) + 9(x + 4)$
 - A) $(y^2 + 9)(x + 4)^2$
 - B) $(x + 3)^2(x + 4)$
 - C) $(y^2 + 9)(x + 4)$
 - D) $y^2(x + 4) + 9$

Factor each polynomial by grouping.

- 7) $8x^3 - 10x^2 + 12x - 15$
- 8) $3x + 18 + xy + 6y$
- 9) $2xy - 6x + y - 3$
 - A) $2x(y - 3)$
 - B) $(y - 3)(2x - 1)$
 - C) $2x + (y - 3)$
 - D) $(y - 3)(2x + 1)$
- 10) $20x^2 - 25xy - 16xy + 20y^2$

- 11) Determine the signs of the binomial factors.
 - a) $x^2 - 13x + 30$
 - b) $y^2 - 17y - 60$
 - c) $a^2 + 8a - 48$
- 12) Explain why $(x + 2)$ and $(x - 15)$ are not the factors of $x^2 - 13x + 30$.

Factor each trinomial.

- 13) $x^2 - 6xy - 40y^2$
- 14) $y^2 - 11y + 18$
- 15) $x^4 + 3x^2 - 54$
 - A) $(x^2 + 54)(x^2 - 1)$
 - B) $(x^2 + 9)(x^2 - 6)$
 - C) $(x^2 - 3)(x^2 + 18)$
 - D) $(x^2 - 9)(x^2 + 3)$
- 16) $z^2 + 12z + 32$
- 17) How do you know when a trinomial is prime (cannot be factored)? Explain.
- 18) Which of the following trinomials are not prime?
 - A) $p^2 + 4p - 3$
 - B) $b^2 + 20b + 51$
 - C) $6x - 27 + x^2$
 - D) $y^2 + 5y - 6$
- 19) Which values of "c" will make the trinomial $x^2 - x - c$ factorable?

A) 42	B) 45
C) 18	D) 56

- 20) Do the terms of the given trinomial share a common factor other than 1?

$$60 + 28p - p^2$$

- 21) Find two factorizations of $60 + 28p - p^2$.

Factor each trinomial completely.

22) $4x^2 + 8x - 32$

23) $x^3 - 8x^2 - 9x$

24) $3x^2y - 6xy - 45y$

- A) $3y(x^2 - 2x - 15)$
 B) $3y(x + 3)(x - 5)$
 C) $3y(x - 3)(x + 5)$
 D) $y(3x - 15)(x + 3)$

- 25) **Find the missing the factors.**

a) $9x^2 - 52x - 12 = (x - 6)(\quad)$

b) $15a^2 + 19a - 10 = (3a + 5)(\quad)$

- 26) Explain why $(6x + 2)$ and $(x + 5)$ are not the factors of $6x^2 + 17x + 10$.

- 27) Given the trinomial $6x^2 - 11x - 10$,

- a) Find two numbers whose product is -60 and whose sum is -11 .
 b) Write $-11x$ using the factors from part (a).
 c) Factor the trinomial by grouping.

Factor each trinomial.

28) $3x^2 - 34x + 11$

29) $10x^2 - 13xt - 3t^2$

30) $12x^2 + 7x - 10$

- 31) If the trinomial $6x^2 - 26x - 20$ is factored as shown, what mistake has been made?

$$6x^2 - 26x - 20 = (6x + 4)(x - 5)$$

- 32) Find a factor of $14x^2 - 49x - 28$.

- A) $(x + 4)$ B) $(14x - 7)$
 C) $(2x - 1)$ D) $(x - 4)$

Factor each trinomial completely.

33) $10p^2 + 6pq - 28q^2$

- A) $2(p - 2q)(5p + 7q)$
 B) $(5p + 2q)(2p - 14q)$
 C) $2(p + 2q)(5p - 7q)$
 D) $(2p + 4q)(5p - 7q)$

34) $27x^2y + 18xy - 24y$

35) $-3x^2 + 18x - 15$

- A) $-(3x - 5)(x - 3)$
 B) $-3(x - 1)(x - 5)$
 C) $-3(x + 1)(x - 5)$
 D) $-(3x - 3)(x - 5)$