MAT 0020 Basic Algebra II

KEY CONCEPT REVIEW

CHAPTER 4, SECTIONS 4.5 – 4.7

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

1) Give an example of a trinomial that is a perfect square trinomial.

2) Which trinomials are not square trinomials? State why.

   A) $2x^2 + 12x + 18$
   B) $25x^2 + 50x + 9$
   C) $a^2 + 16x - 36$
   D) $9y^2 - 6xy + x^2$

Factor each trinomial completely.

3) $9a^2 - 30a + 25$

4) $4x^2 + 24x + 36$

5) $y^3 - 18y^2 + 81y$

6) $48x^2 + 72x + 27y^2$

   A) $3\,(4x + 3y)(4x - 3y)$
   B) $3\,(4x - 3y)^2$
   C) $3\,(4x + 3y)^2$
   D) $3\,(2x + 3y)(8x + 3y)$

7) What value of "c" makes the trinomial $x^2 - 22x + c$ a perfect square trinomial?

8) Give an example of a binomial that is a difference of squares.

9) Which binomials are not differences of squares? State why.

   A) $4c^2 - 24c^2d^2$
   B) $12a^3b - 108ab^3$
   C) $16x^2 + 64y^2$
   D) $-81q^2 + 9p^2$

Factor each binomial completely.

10) $36 - 49y^2$

11) $x^2 - \frac{1}{16}$

12) $25a^3 - 64a$

13) $q^4 - 16p^4$

   A) $(q^2 + 4p^2)(q^2 - 4p^2)$
   B) $(q^2 + 4p^2)(q + 2p)(q - 2p)$
   C) $(q^2 - 4p^2)^2$
   D) $(q + 2p)^2q - 2p)^2$

14) How do you factor a polynomial with 2 terms? Explain.

15) Factor each binomial:

   a) $24x^2 - 150$

   b) $21m^2 - 7r^3$

16) How do you factor a polynomial with 3 terms?

17) Factor each trinomial:

   a) $-8x^3 + 32x^2 - 30x$

   b) $u^2 - 14uv + 49v^2$

   c) $10x^2 + 35x - 20$

18) How do you factor a polynomial with 4 terms?

19) Factor each four-term polynomial.

a) $5x^2 + 20x - xy - 4y$

b) $9x^2p + 9x^2q^3 - p - q^3$

20) How do you know when a polynomial is factored completely?

21) State why each polynomial is <u>not</u> factored completely.

a) $4x^2 + 24x + 36 = (2x + 6)^2$

b) $3x^3 - 15x^2 + 18x = 3x\,(x^2 - 5x + 6)$

22) How do you know if you have factored a polynomial correctly?

23) Find the error in each factorization.

a) $p^2 - p - 42 = (p - 6)(p - 7)$

b) $9m^2 + 30m + 16 = (3m + 4)^2$

c) $12x^2 + 17x - 5 = (4x + 1)(3x - 5)$

24) What does it mean to write a quadratic equation in "standard form?"

25) Which equations are <u>not</u> written in standard form?

A) $16 - x^2 = 6x$
B) $(x - 0.2)(x - 0.9) = 0$
C) $7x^2 + 28x = 0$
D) $x\,(x - 5) = 24$

Solve each equation.

26) $(3y + 7)(2y - 5) = 0$

27) $11d^2 - 4d = 0$

28) $x^2 - 12x = -20$

29) $9x^2 = 36$

30) $4x^2 - 5x - 9 = 0$

31) State whether the following statements are true or false.

a) If $x(x + 2) = 8$, then $x = 8$ or $x + 2 = 8$.

b) If $x^2 = 16$, then $x = -4$ and 4.

c) The equation $x^2 + 14x + 49$ has one solution, $x = -7$.

d) The equation $3x^2 - 15x + 12 = 0$ has a solution of $x = 3$.

32) **Translate and solve:** When fourteen is added to the square of a number the result is nine times that same number.

Solve each problem.

33) If the sides of a square are increased by 2 meters, the area becomes 25 square meters. Find the side of the original square.

A) 7 meters
B) 3 meters
C) 2 meters
D) 5 meters

34) The product of two consecutive integers is 11 more then their sum. Find all such integers.

35) An object is thrown upward from the top of a 160-foot building with an initial velocity of 38 feet per second. The height h of the object after t seconds is given by the quadratic equation $h = -16t^2 + 48t + 160$. When will the object hit the ground? (*Hint: let h = 0 and solve the equation for t.*)

A) −2 seconds
B) 160 seconds
C) 5 seconds
D) 2 seconds