Lesson 6.3(F'09)

Objectives; To solve polynomial equation by:

a) factoring

b) factoring by grouping

c) the root method

To find the factors, zeros, x-intercepts and solutions of polynomial equations.

To estimate solutions using technology.

Polynomial Equation

$$a_n x^n + a_{n-1} x^{n-1} + a_{n-2} x^{n-2} + \ldots + a_1 x + a_0 = 0$$

Equivalent Statements

(x – a) is a factor of *f(x)*

a is a zero of the function *f*

a is a solution to the equation *f(x)* = 0

a is an *x*-intercept of the graph of *y = f(x)*

The graph crosses the *x*-axis at the point *(a* ,0)

Solve by Factoring

#6 $2x^3 - 8x = 0$

#10 $x^4 - 3x^3 + 2x^2 = 0$

Solve by Grouping

#12 $x^3 + 5x^2 - 4x - 20 = 0$ #14 $4x^3 - 8x^2 - 36x - 72 = 0$

Solve using the Root Method

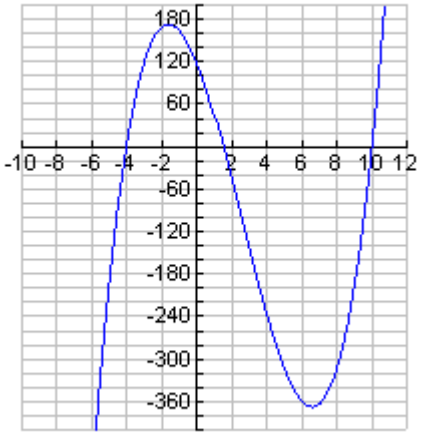
$2x^4 - 32 = 0$

Solve by factoring and using the root method

#20 $3x^4 - 24x^2 = 0$ #24 $x^4 - 10x^2 + 25 = 0$

Use the graph to solve

$2x^3 - 15x^2 - 62x + 120 = 0$

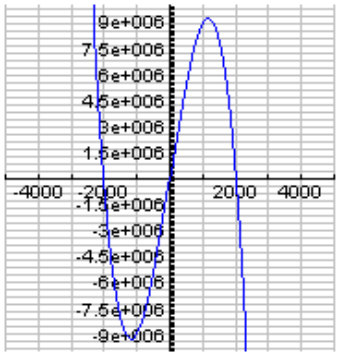


Applications

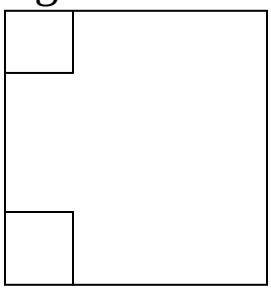
EXAMPLE (PAGE 468)#34 The revenue from the sale of a product is given by the function $R = 12{,}000x - 0.003x^3$

a. Use factoring and the root method to find the numbers of units that must be sold to give zero revenue.

b. Does the graph of the revenue function verify this solution? over



EXAMPLE #39 A box can be formed by cutting squares out of each corner of a piece of tin and folding the "tabs' up. Suppose the piece of tin is 18 inches by 18 inches and each side of the square that is cut out has a length of x.



a. Write an expression for the height of the box that is constructed.

b. Write an expression for the dimensions of the base of the box that is constructed.

c. Use the formula V = lwh to find an equation that represents the volume of the box.

d. Use the equation that you constructed to find the values of x that make V = 0.

e. For which of these values of x does a box exist if squares of length x are cut out and the tabs are folded up?

EXAMPLE(page 469)#42 The total cost for a product is given by $C(x) = 3x^3 - 6x^2 - 300x + 1800$, where *x* is the number of units produced and *C* is the cost in hundreds of dollars. Use factoring by grouping to find the number of units that will give a total cost of $120,000.

Homework: Course Compass section 6.3 and bookwork page 467 #25, 27,29

DUE BY _____