



Precalculus

Quiz No.: 2

Mr. Reyes

Chapter 3 section 3

Name

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1. Find a polynomial of degree 3 that has the indicated zeros and satisfies the given condition. (5 points)

-5, 2, 4;

$F(3) = -24$

$$f(x) = a(x - (-5))(x - 2)(x - 4)$$

$$f(3) = -24 = a(3 + 5)(3 - 2)(3 - 4)$$

$$-24 = a(8)(1)(-1)$$

$$\frac{-24}{-8} = a \Rightarrow a = 3$$

$$f(x) = 3(x + 5)(x - 2)(x - 4)$$

$$f(x) = 3(x + 5)(x^2 - 2x - 4x + 8)$$

$$f(x) = 3(x + 5)(x^2 - 6x + 8)$$

$$f(x) = 3(x^3 - 6x^2 + 8x + 5x^2 - 30x + 40)$$

$$f(x) = 3(x^3 - x^2 - 22x + 40)$$

$$f(x) = 3x^3 - 3x^2 - 66x + 120$$

2. Find the zeros of $f(x)$, and state the multiplicity of each zero. (10 points)

$$f(x) = (x^2 + x - 12)^3 (x^2 - 9)^2$$

$$[(x + 4)(x - 3)]^3 [(x + 3)(x - 3)]^2$$

-4 multiplicity 3

3 multiplicity 3

3 multiplicity 2

-3 multiplicity 2

OR 3 multiplicity 5

3. Show that the number is a zero of $f(x)$ of the given multiplicity and express $f(x)$ as a product of linear factors. Use synthetic division. (5 points)

$$f(x) = x^4 - 9x^3 + 22x^2 - 32$$

4 (Multiplicity 2)

$$\begin{array}{r|rrrrr} 4 & 1 & -9 & 22 & 0 & -32 \\ & & 4 & -20 & 8 & 32 \\ \hline & 1 & -5 & 2 & 8 & 0 \end{array}$$

$$\begin{array}{r|rrrr} 4 & 1 & -5 & 2 & 8 \\ & & 4 & -4 & -8 \\ \hline & 1 & -1 & -2 & 0 \end{array}$$

$$f(x) = (x - 4)(x - 4)(x^2 - x - 2)$$

4. Given the set of data of a polynomial degree 3, determine:

- the factors (simplest form) of the polynomial (1 pt bonus) *
- the lead coefficient (1 pt bonus)
- the polynomial (1 pt bonus)

a. $f(x) = a(x+5)(x-0)(x-4)$
 $f(x) = ax(x+5)(x-4)$

b. $f(-1) = 10 = a(-1)(-1+5)(-1-4)$

$f(-1) = 10 = a(-1)(4)(-5)$

$10 = 20a$

$\frac{10}{20} = a$

$\frac{1}{2} = a$

c. $f(x) = \frac{1}{2}x(x+5)(x-4)$

$f(x) = \frac{1}{2}x(x^2+x-20)$

$f(x) = \frac{x^3}{2} + \frac{x^2}{2} - 10x$

x	f(x)
-5	0.0
-4.8	4.2
-4.6	7.9
-4.4	11.1
-4.2	13.8
-4	16.0
-3.8	17.8
-3.6	19.2
-3.4	20.1
-3.2	20.7
-3	21.0
-2.8	20.9
-2.6	20.6
-2.4	20.0
-2.2	19.1
-2	18.0
-1.8	16.7
-1.6	15.2
-1.4	13.6
-1.2	11.9
-1	10.0
-0.8	8.1
-0.6	6.1
-0.4	4.0
-0.2	2.0
0	0.0
0.2	-2.0
0.4	-3.9
0.6	-5.7
0.8	-7.4
1	-9.0
1.2	-10.4
1.4	-11.6
1.6	-12.7
1.8	-13.5
2	-14.0
2.2	-14.3
2.4	-14.2
2.6	-13.8
2.8	-13.1
3	-12.0
3.2	-10.5
3.4	-8.6
3.6	-6.2
3.8	-3.3
4	0.0
4.2	3.9
4.4	8.3
4.6	13.2
4.8	18.8
5	25.0

use to determine the lead coefficient