

Homework Day 3 ~ Find ALL ZEROS

#1 - 5 Find all the zeros of the polynomial. (Hint: GRAPH first!)

1.) $f(x) = x^3 + 7x^2 + 25x + 175$ $x = -7$

$x = \pm 5i$

2.) $h(x) = x^3 - 2x^2 + 4x - 8$ $x = 2$

$x = \pm 2i$

3.) $g(x) = x^3 - 2x^2 + 10x$ $x = 0$

$x = 1 \pm 3i$

4.) $j(x) = 3x^3 - 19x^2 + 33x - 9$ $x = 3$ M. of 2
 $x = \frac{1}{3}$

5.) $b(x) = x^4 - 4x^3 + 7x^2 - 16x + 12$ $x = 1$ $x = 3$ $x = \pm 2i$

6.) The volume of a rectangular prism is represented by the expression $x^3 + x^2 - 8x - 12$. If the length is $x - 3$ and the height and width are equal, what is the width of the prism?

$w = (x + 2)$

Name: Key

Math 3 Honors

Find all remaining roots, real and complex. Separate sheet of paper

1) Given 2 is a zero of $f(x) = x^3 - 2x^2 - 9x + 18$,

$x = \pm 3 \quad x = 2$

2) given $-1/2$ is a root of $f(x) = 2x^3 - 5x^2 - 13x - 5$

$x = -1/2 \quad x = \frac{3 \pm \sqrt{29}}{2}$

3) Solve $f(x) = x^3 + x + 10$ if -2 is a root

$x = -2$
 $x = 1 \pm 2i$

4) $x^4 - 6x^3 + 6x^2 + 24x - 40 = 0$ given a root is $3 + i$

omit $x = \pm 2 \quad x = 3 \pm i$

6) Find all roots $f(x) = x^3 + 3x^2 - 4x - 12$

use calculator $x = 2 \quad x = -3$
 $x = -2$

8) Find all roots $x^3 - 22x - 24 = 0$

$x = -4 \quad x = 2 \pm \sqrt{10}$

5) Solve $x^4 + x^3 + 6x^2 - 14x - 20 = 0$ if $-1 + 3i$ is a root

omit $(x^2 + 2x + 10)(x - 2)(x + 1)$
 $x = -1 \pm 3i \quad x = 2 \quad x = -1$

7) Find all roots $y = x^4 + 6x^3 + 7x^2 - 8x - 6$

use calculator $x = -3 \quad x = 1 \quad x = 2 \pm \sqrt{2}$

Write the polynomial equation in factored form & standard form given the roots and the multiplicity.

7. $x = -2$ M2, $x = 3$

$y = (x+2)^2(x-3)$ ← factored
 $-4(x+2)^2(x-3)$ ← standard

Lead coefficient -4

$y = -4x^3 - 4x^2 + 32x + 48$

9. $x = 3, x = 3i$

$y = (x-3)(x^2+9)$ ← factored
 $= x^3 - 3x^2 + 9x - 27$ ← standard

8. $x = 0, x = 5$ M2, $x = -1$

$y = x(x-5)^2(x+1)$ ← factored

$y = x^4 - 9x^3 + 15x^2 + 25x$ ← standard

10. $x = -6, x = 2 + i$

$y = (x+6)(x-2-i)(x-2+i)$

$y = x^3 + 2x^2 - 19x + 30$

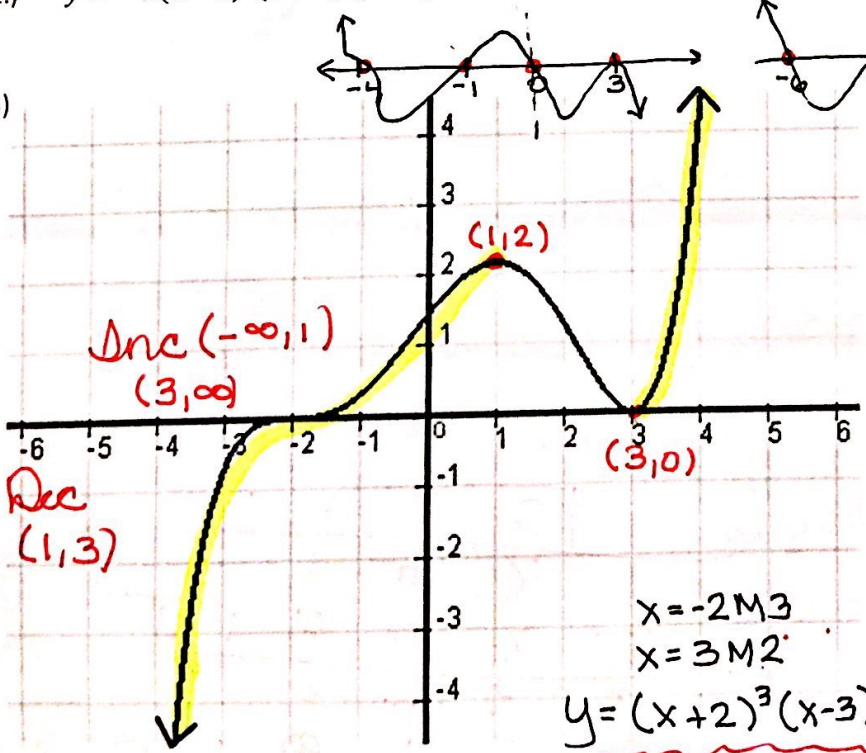
$= (x+6)(x^2 - 4x + 5)$ ← factored

12.) $y = (x-5)^3(x+1)^2(x+6)$

Sketch the graph, state the roots and multiplicity:

11.) $y = -x(x-3)^2(x+4)^3(x+1)$ ← LC

13)



- Even/Odd Degree
- Positive/Negative LC
- Number of Maximums
- Number of Minimums
- Increasing/Decreasing:
- Domain: $(-\infty, \infty)$
- Range: $(-\infty, \infty)$
- Zeros with Multiplicities
- Equation:
- Factored:
- Standard
- Possible Degree

$x = -2$ M3
 $x = 3$ M2
 $y = (x+2)^3(x-3)^2$