Bellwork Alg 2 Monday, November 12, 2018

1. Find all EXACT Complex zeros: $y = x^5 - 4x^4 + 6x^3 - 24x^2 - 27x + 108$

a. Graph to find all EXACT REAL zeros.

b. Then use division to help find the remaining zeros.

2. Find all EXACT Complex zeros: $x^3 - 4x^2 + x + 26 = 0$

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ANSWERS

1. Find all EXACT Complex zeros: $y = x^5 - 4x^4 + 6x^3 - 24x^2 - 27x + 108$

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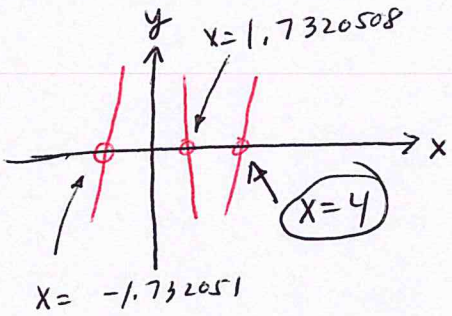


only EXACT Real zero = 4

$x = 4$

4 | 1 -4 6 -24 -27 108

4 0 24 0 -108

1 0 6 0 -27 0

$x^4 + 6x^2 - 27$

-27, +9, -3, +6

$(x^2+9)(x^2-3)$

$x^2+9=0$

$\sqrt{x^2}=\sqrt{-9}$

$x = \pm 3i$

$x^2-3=0$

$\sqrt{x^2}=\sqrt{3}$

$x = \pm\sqrt{3}$

ZEROS:

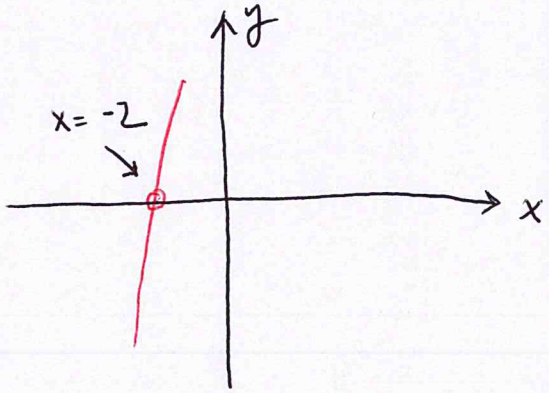
$x = 4, \pm 3i, \pm\sqrt{3}$

2. Find all EXACT Complex zeros: $x^3 - 4x^2 + x + 26 = 0$

a. Graph to find all EXACT REAL zeros.

b. Then use division to help find the remaining zeros.

ONLY EXACT Real zero = -2



$x = -2$

-2 | 1 -4 1 26

-2 12 -26

1 -6 13 0

$x^2 - 6x + 13$

THIS DOESN'T FACTOR, USE Completing the Square OR Quadratic Formula

$b^2 - 4ac = -16$

$x = \frac{6 \pm \sqrt{-16}}{2} = \frac{6 \pm 4i}{2}$

$x = 3 \pm 2i$

ZEROS: $x = -2, 3 \pm 2i$