

MTH-PC College Algebra Session 27 1/5

Build an equation with the following zeros:

2 mult of 3, $(x-2)^3$
 -5 mult of 2, $(x+5)^2$
 ± 3 , $(x-3)(x+3)$
 $x^2 - 3x + 3x - 9$
 $x^2 - 9$

$x = 2$
 $-2 -2$

$x - 2 = 0$

$(x-2)^3 (x+5)^2 (x-9)$

- # possible solutions: 7
- # actual solutions: 4
- # real solutions: 7

5 mult of 2, -8 mult of 4, $\pm 2i$

$x = \pm 2i$ $x = \pm 2\sqrt{-1}$ $\pm 2 = \sqrt{4}$ $\sqrt{4} = \pm 2$

$x = \pm \sqrt{4}\sqrt{-1}$
 $(x)^2 = (\pm \sqrt{-4})^2$
 $x^2 = -4$
 $+4$ $+4$ $x^2 + 4 = 0$

$+ \cdot + = +$
 $- \cdot - = +$

$\pm 2i = x + 4$
 $\pm 8i = x^2 + 64$

\downarrow 5 mult of (2), \downarrow -8 mult of (4) $\pm 2i$

$$(x-5)^2 (x+8)^4 (x^2+4)$$

possible solutions: 8 tot. exponents
 actual solutions: 2 graph
 real solutions: 6

Find the lowest degree polynomial with the

zeros: -2, 3, $4i$ $\rightarrow x^2+16$ hidden $-4i$ $i = \pm\sqrt{-1}$

$$\begin{aligned}
 x &= -2 \\
 +2 &+2 \\
 (x+2) &= 0
 \end{aligned}$$

$$(x+2)(x-3)(x^2+16)$$

$$x = 4i$$

$$x^3 + 9x^2 + 8x$$

Find zeros and graph

$$x(x^2 + 9x + 8)$$

zeros: $x=0$

$$\begin{aligned}
 x+1 &= 0 \\
 -1 &-1
 \end{aligned}$$

$$x(x+1)(x+8)$$

$$\begin{aligned}
 x &= -1 \\
 x &= -8
 \end{aligned}$$

$$x(x+1)(x+8)$$

$$x = 0, -1, -8$$



$$\begin{array}{l}
 \textcircled{x} (x+1) (x+8) \\
 \downarrow \quad \quad \quad \downarrow \\
 -10 \quad (-) \quad (-) \quad (-) = \ominus \\
 \quad \quad \quad \downarrow \quad \quad \downarrow \\
 \quad \quad \quad (-\frac{1}{2}+1) \quad (-\frac{1}{2}+8) \\
 -\frac{1}{2} \quad (-) \quad (+) \quad (+) \\
 \quad \quad \quad (-) \quad (+) = \ominus
 \end{array}$$

$$\begin{array}{l}
 (x) (x+1) (x+8) \\
 -5: \quad (-) \quad (-) \quad (-) = \oplus \\
 \quad \quad \quad (-) \quad (-) \quad (+) = \oplus
 \end{array}$$

$$\begin{array}{l}
 (x) (x+1) (x+8) \\
 1: \quad (+) \quad (+) \quad (+) = \oplus
 \end{array}$$

