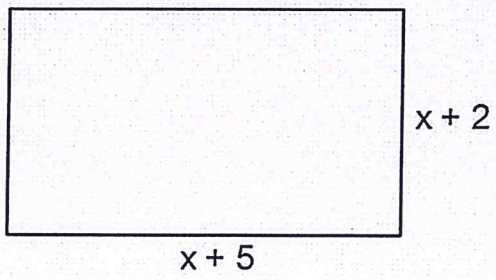
Bellwork Alg 2 Wednesday, December 4, 2019

1. Find all four roots to this polynomial: $f(x) = x^4 + 3x^3 + 4x^2 - 4x - 48$

2. Given the rectangle with dimensions shown:



Find the value of x that gives an area of 208 in^2.

3. Find all five zeros of this polynomial $f(x) = 7x^5 - 10x^4 + 73x^3 - 58x^2 + 180x - 72$ given that $x^2 - x + 6$ is a factor.

ANSWERS

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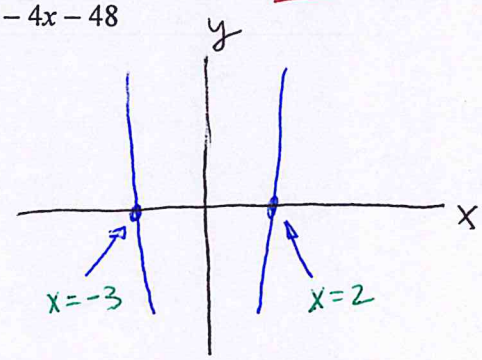
1. Find all four roots to this polynomial: $f(x) = x^4 + 3x^3 + 4x^2 - 4x - 48$

-3	1	3	4	-4	-48
		-3	0	-12	48
	1	0	4	-16	0

2	1	0	4	-16
		2	4	16
	1	2	8	0

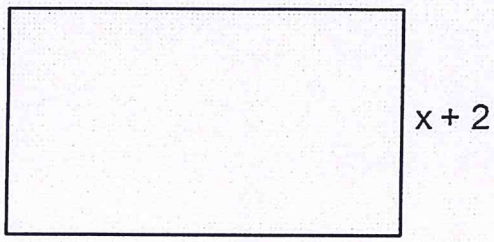
$x^2 + 2x + 8$ $\quad b^2 - 4ac = -28$

$x = \frac{-2 \pm \sqrt{-28}}{2} \rightarrow \sqrt{4 \cdot 7} = \frac{-2 \pm 2i\sqrt{7}}{2}$



$x = -3, 2, -1 \pm i\sqrt{7}$

2. Given the rectangle with dimensions shown:



Find the value of x that gives an area of 208 in^2.

$A = L \cdot W$

$208 = (x+5)(x+2)$

$208 = x^2 + 7x + 10$

$-208 \qquad -208$

$0 = x^2 + 7x - 198$

-198	
+18	-11
	+7

$(x+18)(x-11)$

$x = -18, 11$

or

$b^2 - 4ac = 841$

$x = \frac{-7 \pm \sqrt{841}}{2}$

$x = -18, 11$

$x = 11$

3. Find all five zeros of this polynomial $f(x) = 7x^5 - 10x^4 + 73x^3 - 58x^2 + 180x - 72$ given that $x^2 - x + 6$ is a factor.

$$\begin{array}{r} 7x^3 - 3x^2 + 28x - 12 \\ x^2 - x + 6 \;\overline{)\; 7x^5 - 10x^4 + 73x^3 - 58x^2 + 180x - 72} \\ -(7x^5 - 7x^4 + 42x^3) \\ \hline -3x^4 + 31x^3 - 58x^2 \\ -(-3x^4 + 3x^3 - 18x^2) \\ \hline 28x^3 - 40x^2 + 180x \\ -(28x^3 - 28x^2 + 168x) \\ \hline -12x^2 + 12x - 72 \\ -(-12x^2 + 12x - 72) \\ \hline 0 \end{array}$$

$7x^3 - 3x^2 + 28x - 12$

	$7x$	-3
x^2	$7x^3$	$-3x^2$
$+4$	$+28x$	-12

$x^2 + 4$ $\quad x = \pm 2i$

$7x - 3$ $\quad x = \frac{3}{7}$

$b^2 - 4ac = -23$

$x = \frac{1 \pm \sqrt{-23}}{2}$

$x = \frac{1 \pm i\sqrt{23}}{2}$