

Polynomial Assignment

Finding all zeros PreCalculus

Name _____

Date _____ Period ____

Section #1

For each given $P(x)$, find all roots. Use any and all techniques discussed in this chapter: including graphing, factoring, completing the square, Quadratic Formula, synthetic division. You must have supporting work for ALL answers. If you use a graph, then draw a little sketch. No decimal answers will be accepted for any problem!

Don't forget...always simplify square roots... for example $\sqrt{40} = 2\sqrt{10}$

1. $P(x) = -2x^3 + 18x^2 - 28x - 60$

2. $P(x) = x^2 - 2x + 5$

Roots: _____

Roots: _____

3. $P(x) = x^4 - 2x^3 - 6x^2 - 18x - 135$

4. $P(x) = x^3 + 4x^2 - 8x - 32$

Roots: _____

Roots: _____

5. $P(x) = x^3 - 19x - 30$

6. Given: $x = 5i$ is a root of
 $P(x) = x^4 + 13x^2 - 300$

Roots: _____

Roots: _____

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Section #2

Use any concepts developed in this chapter to correct answer these remaining polynomial questions.

1. If the **Fundamental Theorem of Algebra** could talk, what would it say about the following polynomial: $P(x) = x^3 + x^2 - 9x - 9$ _____

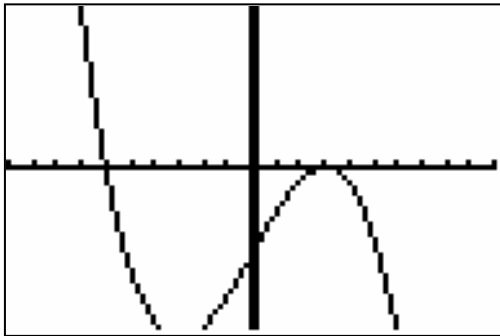
2. Write a degree 4 polynomial that has as roots: $x = \pm 5$ and $x = 7$ which has a multiplicity of two.
Must show supporting work.

$P(x) =$ _____

3. Write a degree 3 polynomial that has as roots: $x = 8$ and $x = \pm 8i$
Must show supporting work.

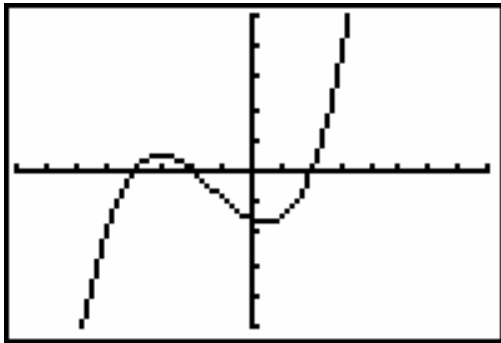
$P(x) =$ _____

4. Write a degree 3 polynomial for the following graph (be sure to check your answer on your calculator)
Must show supporting work.

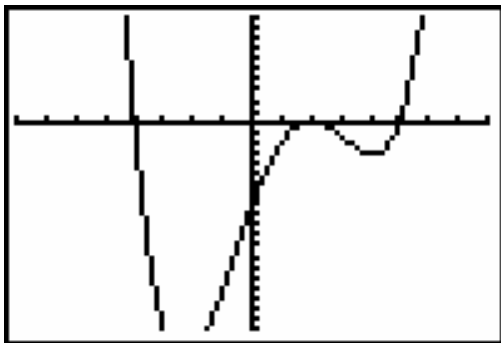


$P(x) = \underline{\hspace{10cm}}$

5. Explain *how* the given polynomial graph could turn out to actually be a **degree 5** polynomial.



6. Give one good mathematical / polynomial reason why this graph could never be degree 5.
 (there are a few acceptable reasons)



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Use a separate piece of paper...

Bonus:

Find all roots for $P(x) = x^6 + 45x^4 + 344x^2 + 720$ if $x = 2i$ and $x = 6i$ are roots

Must show all supporting (synthetic) work