SATPREP Name_____ ID: 1

Assignment:Polynomial Date_____ Period____

Find the remainder when $f(x)$ is divided by $x - k$.

1) $f(x) = 3x^4 - 4x^3 - 9x^2 + 10x$
$k = -1$

2) $f(x) = 3x^4 + 5x^2 + 2x - 5$
$k = -1$

3) $f(x) = x^3 + 8x^2 + 19x$
$k = -1$

4) $f(x) = 6x^3 + 19x^2 + 15x$
$k = -2$

A polynomial function with rational coefficients has the following zeros. Find all additional zeros.

5) $-5,\ \ 2 + \sqrt{5},\ \ 2 - i$

6) $-3 - 2i,\ \ 3 - 2i$

Write a polynomial function of least degree with integral coefficients that has the given zeros.

7) $\frac{3}{5},\ \ -\frac{4}{3},\ \ -1$

8) $0,\ \ -\frac{2}{5},\ \ -\frac{3}{4}$

9) $-\frac{2}{3},\ \ i,\ \ -i$

10) $\frac{1}{3},\ \ -3 - 2i$

State the number of complex roots, the possible number of real and imaginary roots, the possible rational roots, and an interval in which all real roots lie for each equation. Then find all roots.

11) $x^3 - 11x^2 - x + 11 = 0$

12) $x^3 + x^2 + x + 1 = 0$

Answers to Assignment:Polynomial (ID: 1)

1) -12

2) 1

3) -12

4) -2

5) $2 - \sqrt{5},\ \ 2 + i$

6) $-3 + 2i,\ \ 3 + 2i$

7) $f(x) = 15x^3 + 26x^2 - x - 12$

8) $f(x) = 20x^3 + 23x^2 + 6x$

9) $f(x) = 3x^3 + 2x^2 + 3x + 2$

10) $f(x) = 3x^3 + 17x^2 + 33x - 13$

11) # of complex roots: 3
Possible # of real roots: 3 or 1
Possible # of imaginary roots: 2 or 0
Possible rational roots: $\pm 1, \pm 11$
Real roots lie in: $[-1, 12]$
Roots: $\{11, 1, -1\}$

12) # of complex roots: 3
Possible # of real roots: 3 or 1
Possible # of imaginary roots: 2 or 0
Possible rational roots: ± 1
Real roots lie in: $[-1, 0]$
Roots: $\{-1, i, -i\}$

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