

Polynomials

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Date _____ Period _____

State the possible rational zeros for each function.

1) $f(x) = x^4 + 6x^2 - 16$

2) $f(x) = 6x^5 + 3x^4 + 16x^3 + 8x^2 + 10x + 5$

Find all zeros.

3) $f(x) = 3x^3 - 5x - 14$

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

5) $f(x) = 3x^4 - x^3 - 31x^2 - 3x$

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

6) $-5, -2 + \sqrt{2}$

7) $1, 2 + 3i, -2 - 2i$

8) $-2, 4, 1 + 3i$

9) $-3, 2i$

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

10) $-2, 3, -5$

11) $5, -2 + 3i$

12) $-3, \sqrt{2}$

13) $2, 2 + \sqrt{7}$

14) $1, -3 + 2i$

15) $1 + 3i, 3i$

Find all zeros. One zero has been given.

16) $f(x) = 3x^4 + 4x^3 - 39x^2 - 76x - 12$; -2

17) $f(x) = 9x^4 + 30x^3 - 8x^2 - 46x + 15$; $-\frac{5}{3}$

18) $f(x) = 4x^5 - 10x^4 - 14x^3 + 35x^2 + 10x - 25$; $\frac{5}{2}$

Factor each and find all roots.

19) $x^3 - x^2 - 12x = 0$

20) $x^4 - 4x^2 - 21 = 0$

$$21) x^4 - 11x^2 + 28 = 0$$

$$22) x^4 - 7x^2 + 12 = 0$$

$$23) x^3 - 4x^2 - 5x = 0$$

$$24) x^3 - 5x^2 + 4x = 0$$

$$25) x^3 + 5x^2 - 3x - 15 = 0$$

$$26) x^6 + 2x^4 - 16x^2 - 32 = 0$$