Name
Date
Course

Solving Polynomial Equations When the Degree Is Greater than Two (Homework)

Use the Rational Zeros Theorem to find all of the potential rational solutions of each polynomial equation. Do not attempt to solve the equations.

① $3x^7 - 2x^4 - x^2 + 5x + 6 = 0$

② $0 = 11x^3 + 6x^2 + 10x - 13$

③ $x^4 + x^3 + x^2 + x + 1 = 0$

④ Use the Rational Zeros Theorem to Solve the equation below.

$x^5 - 7x^4 + 10x^3 + 2x^2 - 11x + 5 = 0$

⑤ Use the Rational Zeros Theorem to find the roots of the polynomial function below.

$f(x) = 2x^3 - x^2 - 8x + 4$

⑥ Use the Rational Zeros Theorem to find the zeros of the polynomial function below and write the multiplicity of each zero.

$f(x) = 7x^4 - 17x^3 - 25x^2 + 29x + 30$

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⑦ Use the Rational Zeros Theorem to find the x-intercepts of the function below, and write the multiplicity of each zero.

$f(x) = 4x^3 + 23x^2 + 39x + 18$

zeros

Answers

① $\boxed{\pm 1, \pm \frac{1}{3}, \pm 2, \pm \frac{2}{3}, \pm 3, \pm 6}$

② $\boxed{\pm 1, \pm \frac{1}{11}, \pm 13, \pm \frac{13}{11}}$

③ $\boxed{\pm 1}$

④ $\boxed{x = 1, -1, 5}$

⑤ $\boxed{\frac{1}{2}, 2, -2}$

⑥ $\boxed{\begin{array}{l} -1 \text{ is a zero of multiplicity 2.} \\ 3 \text{ is a zero of multiplicity 1.} \\ \frac{10}{7} \text{ is a zero of multiplicity 1.} \end{array}}$

⑦ $\boxed{\begin{array}{l} -3 \text{ is a zero of multiplicity 1.} \\ -2 \text{ is a zero of multiplicity 1.} \\ -\frac{3}{4} \text{ is a zero of multiplicity 1.} \end{array}}$