

# 3.1-3.3 Quiz Review

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Use long division to divide the polynomial.

1.  $\frac{2x^2 - 9x - 5}{x - 5}$

2.  $\frac{4x^2 - 10x + 6}{4x + 2}$

3.  $\frac{2x^3 + 3x^2 - 4x + 15}{x + 3}$

Use synthetic division to find the quotient.

4.  $\frac{3x^3 - 2x^2 + x - 4}{x + 3}$

5.  $\frac{x^3 - 3x + 2}{x + 2}$

6.  $(4x^3 - 5x^2 + 13) \div (x + 4)$

Use synthetic division to determine whether the first expression is a factor of the polynomial.

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

8.  $P(x) = 3x^4 - 6x^3 - 5x + 10$ ,  $x - 2$

9.  $P(x) = 2x^4 - x^3 + 2x - 1$ ,  $x - \frac{1}{2}$

Examine the leading term to determine the far-left and far-right behavior of the graph of each polynomial function.

10.  $P(x) = 3x^3 + 2x^2 - 10$

11.  $P(x) = -7x^4 - 3x^3 - x + 6$

12.  $P(x) = -x^3 + 12x - 4$

Find all relative and absolute extreme values.

13.  $P(x) = 2x^3 + x^2 - 7x - 6$

14.  $P(x) = x^4 + 2x^3 - 9x^2 - 2x + 8$

15.  $P(x) = 4x^3 - 3x + 1$

**Find the zeros of each polynomial function. If a zero is a multiple zero, state it a multiplicity.**

16.  $P(x) = x^3 - 8x^2 + 25x - 26$

17.  $P(x) = 2x^3 - 3x^2 + 32x + 17$

18.  $P(x) = 4x^4 + 4x^3 - 25x^2 - x + 6$

19.  $P(x) = x^4 + 2x^3 - 4x^2 - 10x - 5$

**Use the Rational Zero Theorem to list possible rational zeros for each polynomial function.**

20.  $P(x) = 3x^4 - 5x^3 - 8x^2 - x + 12$

21.  $P(x) = 2x^4 + 4x^3 - 10x^2 - x + 10$

**Find the smallest positive integer that is the upper bound and the largest negative integer that is a lower bound of the real zeros of each polynomial.**

22.  $P(x) = x^3 - 3x^2 + 6x - 12$

23.  $P(x) = 2x^3 + 6x^2 - 5x - 13$

**Use Descartes' Rule of Signs to state the number of possible positive and negative real zeros of each polynomial function.**

24.  $P(x) = 3x^3 + 10x^2 - 6x - 8$

25.  $P(x) = 5x^4 - 7x^3 - 11x^2 + 12x - 3$

**Find the zeros of each polynomial function. If a zero is a multiple zero, state it a multiplicity.**

26.  $P(x) = 3x^3 + 4x^2 - 5x - 2$

27.  $P(x) = 4x^4 - 4x^3 - 19x^2 - 14x - 3$