

Quiz Review 4.1 – 4.4

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

Domain: \_\_\_\_\_

Range: \_\_\_\_\_

Total # of roots: \_\_\_\_\_

Real Roots: \_\_\_\_\_

Imaginary Roots: \_\_\_\_\_

Absolute min: \_\_\_\_\_

Absolute max: \_\_\_\_\_

Relative min: \_\_\_\_\_

Relative max: \_\_\_\_\_

As  $x \rightarrow \infty, f(x) \rightarrow$  \_\_\_\_\_

As  $x \rightarrow -\infty, f(x) \rightarrow$  \_\_\_\_\_

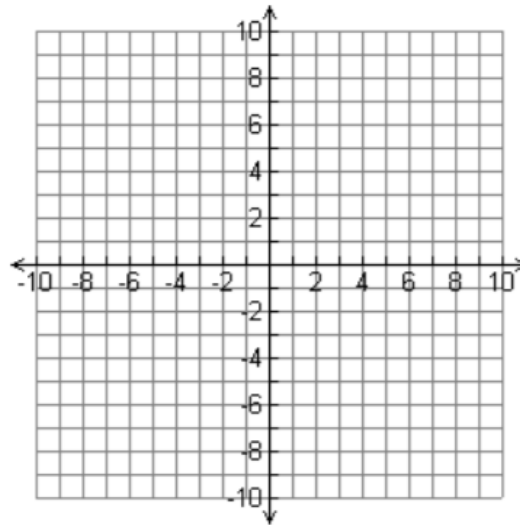
Increasing interval(s): \_\_\_\_\_

Decreasing interval(s): \_\_\_\_\_

Find a window that shows the whole graph.

x min \_\_\_\_\_ x max \_\_\_\_\_

y min \_\_\_\_\_ y max \_\_\_\_\_



2.  $f(x) = -x^4 + 2x^3 + 4x^2 - 11x + 6$

Domain: \_\_\_\_\_

Range: \_\_\_\_\_

Total # of roots: \_\_\_\_\_

Real Roots: \_\_\_\_\_

Imaginary Roots: \_\_\_\_\_

Absolute min: \_\_\_\_\_

Absolute max: \_\_\_\_\_

Relative min: \_\_\_\_\_

Relative max: \_\_\_\_\_

As  $x \rightarrow \infty, f(x) \rightarrow$  \_\_\_\_\_

As  $x \rightarrow -\infty, f(x) \rightarrow$  \_\_\_\_\_

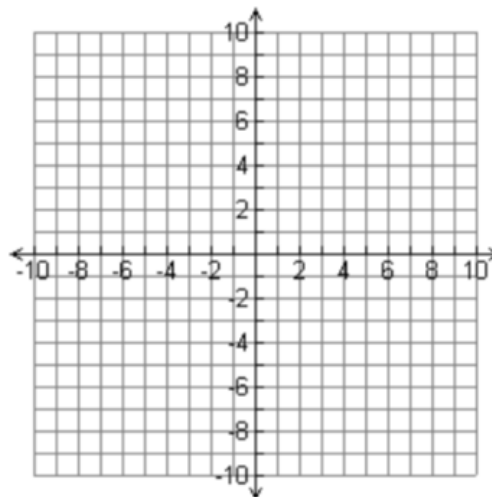
Increasing interval(s): \_\_\_\_\_

Decreasing interval(s): \_\_\_\_\_

Find a window that shows the whole graph.

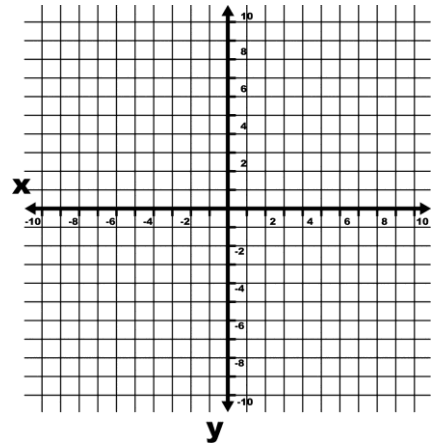
x min \_\_\_\_\_ x max \_\_\_\_\_

y min \_\_\_\_\_ y max \_\_\_\_\_

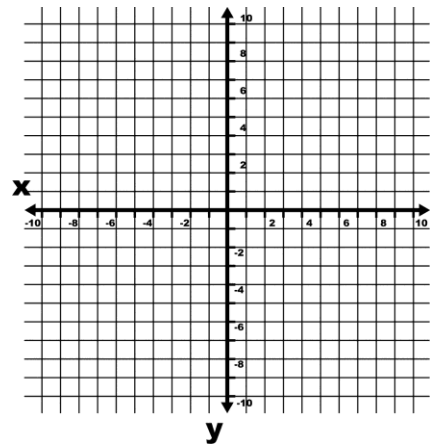


Sketch a graph matching each description without your calculator. Then use your calculator to check your sketch.

3) A cubic function with 3 real zeros and a negative leading coefficient.



4) A quartic function with 2 real zeros where each has a multiplicity of two. The leading coefficient is positive.



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State the degree, end behavior, y-intercept, x-intercepts, and increasing/ decreasing intervals for the following functions.

5)  $(x + 2)(x - 4)(5 - x)$

6)  $(x + 1)^2(x + 3)(x - 2)$

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Simplify the following polynomials completely. Write your final answer in standard form.

7)  $(x^3 - x + 2) + (x^2 - 2x - 7) - (2x^3 - 3x^2 + 5x + 4)$

8)  $(n - 2)(n^3 - 2n + 7)$

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**First determine if the binomial is a factor of the polynomial given using the Remainder Theorem. Then divide to prove your answer. Be able to use both long division and synthetic division.**

9) LONG division.  $(2x^3 - x^2 - 13x - 6) \div (2x + 1)$

10) SYNTHETIC division.  $(x^4 + 2x^3 - x^2 + 6) \div (x - 1)$

**Factor the polynomials completely.**

11)  $12n^3 + 96n^2 + 192n$

12)  $108y^6 + 32y^3$

13)  $x^3 + x^2 - 16x - 16$

14)  $7p^{12} + 49p^9 + 70p^6$

15) Show that  $x - 2$  is a factor of  $f(x) = 3x^4 - 8x^3 + 4x^2 + 4x - 8$ . Then factor completely, if possible.

**Random:**

16) Write an expression for the area and perimeter for the figure shown.

