

Name: _____

College Algebra: Review (Test 3)

1. Fill in the boxes to describe the long-term behavior of the following polynomial.

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

• As $x \rightarrow \infty$, $p(x) \rightarrow$

• As $x \rightarrow -\infty$, $p(x) \rightarrow$

2. The polynomial

$$p(x) = x^5 - 3x^4 - 11x^3 + 27x^2 + 10x - 24$$

has roots at 4; -3; 2; 1. Completely factor $p(x)$ as a product of linear factors.

3. Construct a polynomial of degree 3 which has roots at 2, -2, and -1.

4. The polynomial

$$p(x) = x^4 + 3x^3 - x^2 - 9x - 6$$

has a root at $\sqrt{3}$. Completely factor $p(x)$ as a product of linear factors.

5. Complete the square to find the standard form of the following parabola.

$$y = x^2 - 8x + 14$$

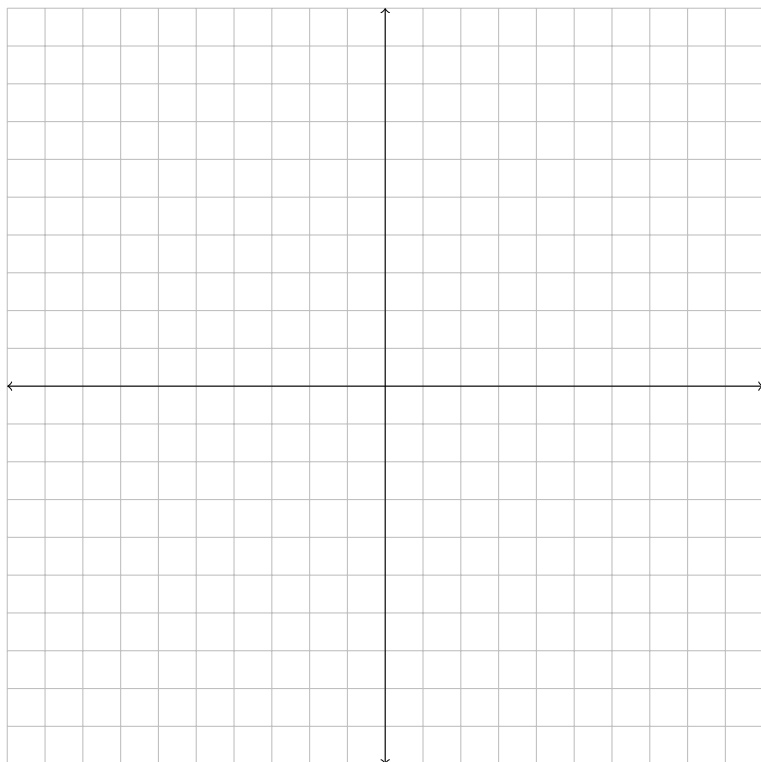
6. Find an equation for the parabola with horizontal directrix having vertex $(-4, -4)$ and focal length 2.

7. Find the domain of the following rational function.

$$f(x) = \frac{x^2 - 1}{x^3 - 3x + 2}$$

8. Plot the following ellipse in the space provided.

$$\left(\frac{x-4}{4}\right)^2 + \left(\frac{y-6}{2}\right)^2 = 1$$



9. Find the long-term behavior asymptote of the following rational function.

$$f(x) = \frac{x^3 - 2x^2 - 9x + 18}{x - 6}$$

10. Plot the following parabola in the space provided.

$$y = \frac{1}{4}(x + 5)^2 + 3$$

