

Name: _____

College Algebra: Review (Test 3)

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

$$p(x) = 3x^3 - 2x + 1$$

• 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 1; -1; 4; 2. Completely factor $p(x)$ as a product of linear factors.

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

4. The polynomial

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

has a root at $\sqrt{2}$. Completely factor $p(x)$ as a product of linear factors.

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

$$y = x^2 + 8x + 19$$

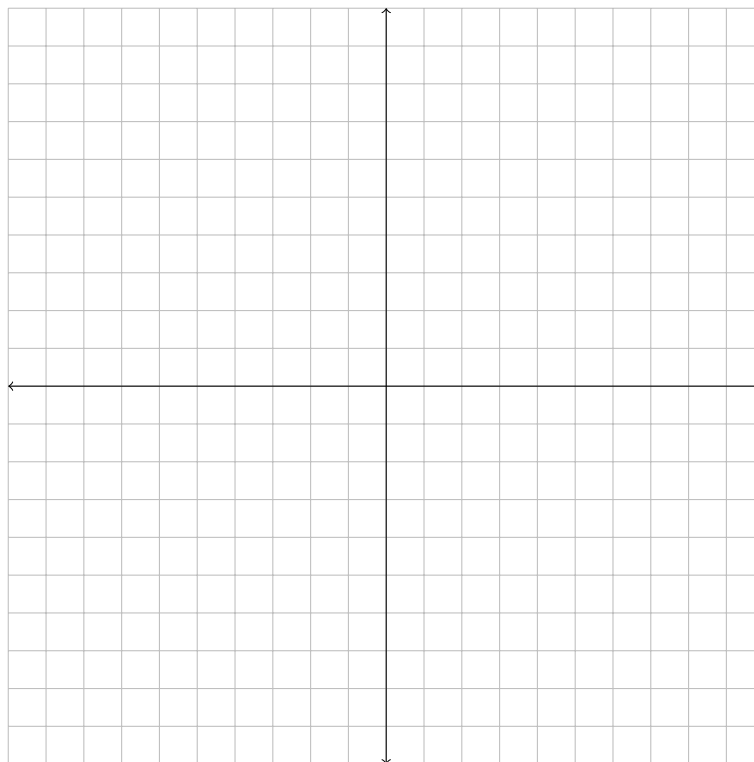
6. Find an equation for the parabola with horizontal directrix having vertex $(3, 2)$ and focal length -3 .

7. Find the domain of the following rational function.

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

8. Plot the following ellipse in the space provided.

$$\left(\frac{x-4}{4}\right)^2 + \left(\frac{y-7}{3}\right)^2 = 1$$



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

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

10. Plot the following parabola in the space provided.

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

