

Precalculus Diagnostic Test (with answers)

1. Simplify:

$$\frac{(x^3)^4 \cdot (\sqrt{x})^4}{x^8 \cdot x^{-3}}$$

Answer: x^9

2. Factor and simplify:

$$f(x) = \frac{x^2 + 7x - 78}{x^2 - 10x + 24}$$

Answer:

$$\frac{x + 13}{x - 4}$$

3. List any vertical or horizontal asymptotes, if they exist, for the following function.

$$f(x) = \frac{4x^2 + 7x - 57}{x^2 + 5x - 24}$$

Vertical Asymptote: $x = -8$

Horizontal Asymptote: $y = 4$

4. What is the x-value of any hole(s) in the graph of the following function?

$$f(x) = \frac{(x^2 + 15x - 324)}{x^2 - 17x + 60}$$

Answer: $x = 12$

5. Simplify:

$$\frac{x^{-1} - x}{8x^8 + 8x^7}$$

Answer:

$$\frac{1 - x}{8x^8}$$

6. Factor completely:

$$96x^{2/9} + 108x^{1/9} + 21$$

Answer: $3(4x^{1/9} + 1)(8x^{1/9} + 7)$