




8.3 EXERCISES

HOMEWORK KEY

-  = **WORKED-OUT SOLUTIONS** on p. WS1 for Exs. 7, 15, and 33
-  = **TAKS PRACTICE AND REASONING** Exs. 6, 14, 24, 35, 37, and 38
-  = **MULTIPLE REPRESENTATIONS** Ex. 33

SKILL PRACTICE

- VOCABULARY** Copy and complete: The graph of a rational function f has no ? when the degree of the function's numerator is greater than the degree of its denominator.
- WRITING** Let $f(x) = \frac{p(x)}{q(x)}$ where $p(x)$ and $q(x)$ are polynomials with no common factors other than ± 1 . Describe how to find the x -intercepts and the vertical asymptotes of the graph of f .

EXAMPLES 1, 2, and 3

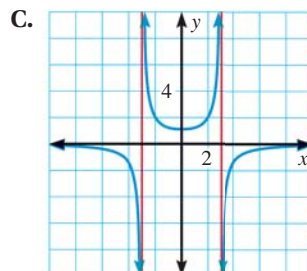
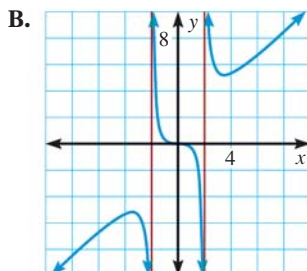
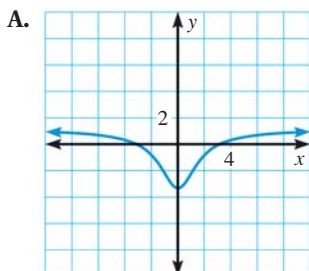
on pp. 565–566 for Exs. 3–23

MATCHING GRAPHS Match the function with its graph.

3. $y = \frac{-10}{x^2 - 9}$

4. $y = \frac{x^2 - 10}{x^2 + 3}$

5. $y = \frac{x^3}{x^2 - 4}$



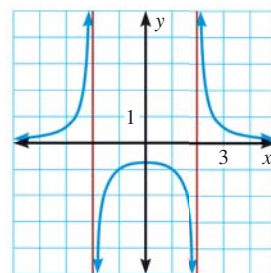
6.  **TAKS REASONING** The graph of which function is shown?

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

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

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

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



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ANALYZING GRAPHS Identify the x -intercept(s) and vertical asymptote(s) of the graph of the function.

7. $y = \frac{5}{x^2 - 1}$

8. $y = \frac{x + 1}{x^2 + 5}$

9. $f(x) = \frac{x^2 + 9}{x^2 - 2x - 15}$

10. $y = \frac{x^2 - 7x - 60}{x + 3}$

11. $y = \frac{x^3 + 27}{3x^2 + x}$

12. $g(x) = \frac{2x^2 - 3x - 20}{x^2 + 1}$

13. **ERROR ANALYSIS** Describe and correct the error in finding the vertical asymptote(s) of $f(x) = \frac{x - 2}{x^2 - 8x + 7}$.

The vertical asymptote occurs at the zero of the numerator $x - 2$. So, the vertical asymptote is $x = 2$. 