8-3 Standardized Test Prep

Rational Functions and Their Graphs

Multiple Choice

For Exercises 1–4, choose the correct letter.

1. What function has a graph with a removable discontinuity at $\left(5, \frac{1}{9}\right)$?

   (A) $y = \dfrac{(x - 5)}{(x + 4)(x - 5)}$

   (B) $y = \dfrac{4}{x - 5}$

   (C) $y = \dfrac{4x - 1}{5x + 1}$

   (D) $y = \dfrac{x + 1}{5x - 4}$

2. What is the vertical asymptote of the graph of $y = \dfrac{(x + 2)(x - 3)}{x(x - 3)}$?

   (F) $x = -3$ (G) $x = -2$ (H) $x = 0$ (I) $x = 3$

3. What best describes the horizontal asymptote(s), if any, of the graph of
   $y = \dfrac{x^2 + 2x - 8}{(x + 6)^2}$?

   (A) $y = -6$

   (B) $y = 0$

   (C) $y = 1$

   (D) The graph has no horizontal asymptote.

4. Which rational function has a graph that has vertical asymptotes at $x = a$ and $x = -a$, and a horizontal asymptote at $y = 0$?

   (F) $y = \dfrac{(x - a)(x + a)}{x}$

   (G) $y = \dfrac{1}{x^2 - a^2}$

   (H) $y = \dfrac{x^2}{x^2 - a^2}$

   (I) $y = \dfrac{x - a}{x + a}$

Short Response

5. How many milliliters of 0.30% sugar solution must you add to 75 mL of 4% sugar solution to get a 0.50% sugar solution? Show your work.