Answer on Question #57113 – Math – Algebra

Question

1. Which is a rational function?

A: y = x-5/x

B: y = 5

C: y = x^2 – 3x + 5

D: y = √x-3

Solution

$y = x - \frac{5}{x} = \frac{x^2-5}{x}$ is a rational function, because it is the ratio of polynomials.

Answer: A: y = x-5/x.

Question

2. y = 2x^2/ 3x^2 -16

what is the horizontal asymptote for the above function?

Y= _____

Solution

$$\lim_{x\to\infty}\left(\frac{2x^2}{3x^2-16}\right) = \lim_{x\to\infty}\left(\frac{2x^2}{x^2(3-\frac{16}{x^2})}\right) = \lim_{x\to\infty}\left(\frac{2}{3-\frac{16}{x^2}}\right) = \frac{2}{3-0} = \frac{2}{3},$$

$$\text{hence } \mathbf{y = \frac{2}{3}} \text{ is the horizontal asymptote for the function } y = \frac{2x^2}{3x^2-16}.$$

Answer: $\mathbf{y = \frac{2}{3}}$.

Question

3. y = 1/x – 5

What is the vertical asymptote for the above function?

X= _____

Solution

Since $\lim_{x\to 5}\frac{1}{x-5} = \infty$, **then** $x = 5$ **is the vertical asymptote for** $y = \frac{1}{x-5}$.

Since $\lim_{x\to 0}\left(\frac{1}{x} - 5\right) = \infty$, **then** $x = 0$ **is the vertical asymptote for** $y = \frac{1}{x} - 5$.

Answer: $x = 5$.