Topic: Intercepts and vertical asymptotes

Question: Find the function's vertical asymptote.

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

Answer choices:

A The function has a vertical asymptote at $x = 1$

B The function has a vertical asymptote at $x = 0$

C The function has a vertical asymptote at $x = \infty$

D The function has a vertical asymptote at $x = -1$

Solution: B

Set the function's denominator equal to 0.

$$x^2 = 0$$

$$x = 0$$

This is the value that makes the denominator 0, so the function has a vertical asymptote at $x = 0$.

Topic: Intercepts and vertical asymptotes

Question: Find the function's vertical asymptotes.

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

Answer choices:

A The function has vertical asymptotes at $x = -2$ and $x = 2$

B The function has vertical asymptotes at $x = -3$ and $x = 3$

C The function has vertical asymptotes at $x = -\sqrt{3}$ and $x = \sqrt{3}$

D The function has vertical asymptotes at $x = -\sqrt{2}$ and $x = \sqrt{2}$

Solution: C

Set the function's denominator equal to 0.

$$x^2 - 3 = 0$$

$$x^2 = 3$$

$$x = \pm\sqrt{3}$$

These are the values that make the denominator 0, so the function has vertical asymptotes at $x = \pm\sqrt{3}$.

Topic: Intercepts and vertical asymptotes

Question: Find the function's vertical asymptotes.

$$f(x) = \frac{2x}{x^2 - 4x + 3}$$

Answer choices:

A The function has vertical asymptotes at $x = 1$ and $x = -3$

B The function has vertical asymptotes at $x = -1$ and $x = -3$

C The function has vertical asymptotes at $x = -1$ and $x = 3$

D The function has vertical asymptotes at $x = 1$ and $x = 3$

Solution: D

Set the function's denominator equal to 0.

$$x^2 - 4x + 3 = 0$$

$$(x - 1)(x - 3) = 0$$

$x = 3$ or $x = 1$

These are the values that make the denominator 0, so the function has vertical asymptotes at $x = 1$ and $x = 3$.