Topic: Point discontinuities

Question: Find the removable discontinuities of the function.

$$f(x) = \frac{x - 5}{x^2 - 25}$$

Answer choices:

A $\quad x = 0$

B $\quad x = -5$

C $\quad x = 5$

D $\quad x = 25$

Solution: C

Factor the numerator and denominator as completely as possible.

$$f(x) = \frac{x - 5}{x^2 - 25}$$

$$f(x) = \frac{x - 5}{(x + 5)(x - 5)}$$

The factor $x - 5$ can be canceled from the numerator and denominator.

$$f(x) = \frac{1}{x + 5}$$

Because $x = 5$ is a value that would have made the denominator 0, but we canceled it out when we canceled $x - 5$, we know that the function has a removable discontinuity at $x = 5$.

Topic: Point discontinuities

Question: Find the removable discontinuities of the function.

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

Answer choices:

A $\quad x = 1$

B $\quad x = -1$

C $\quad x = 2$

D $\quad x = -2$

Solution: A

Factor the numerator and denominator as completely as possible.

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

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

The factor $x-1$ can be canceled from the numerator and denominator.

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

Because $x = 1$ is a value that would have made the denominator 0, but we canceled it out when we canceled $x - 1$, we know that the function has a removable discontinuity at $x = 1$.

Topic: Point discontinuities

Question: Find the removable discontinuities of the function.

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

Answer choices:

A $x = -3$

B $x = -2$

C $x = -1$

D $x = 1$

Solution: D

Factor the numerator and denominator as completely as possible.

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

$$f(x) = \frac{(x + 3)(x - 1)}{(x + 2)(x - 1)}$$

The factor $x - 1$ can be canceled from the numerator and denominator.

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

Because $x = 1$ is a value that would have made the denominator 0, but we canceled it out when we canceled $x - 1$, we know that the function has a removable discontinuity at $x = 1$.