

Topic: Point discontinuities

Question: Find the removable discontinuities of the function.

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

Answer choices:

- A $x = 0$
- B $x = -5$
- C $x = 5$
- D $x = 25$



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 $x = 1$
- B $x = -1$
- C $x = 2$
- D $x = -2$



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 $x = 1$.

