



Polynomials and Rationals

Warmup:

- Which of the following is **NOT** a possible combination of real and imaginary solutions for a cubic (5th degree) polynomial?
A. 0 real, 5 imaginary B. 1 real, 4 imaginary C. 3 real, 2 imaginary D. 5 real, 0 imaginary
- If $\frac{5}{x-2} - \frac{15}{x+4} = 0$, then $x = ?$
A. -3 B. -1 C. 3 D. 5

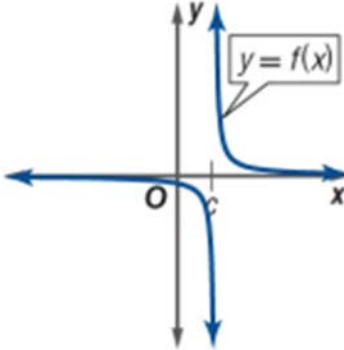
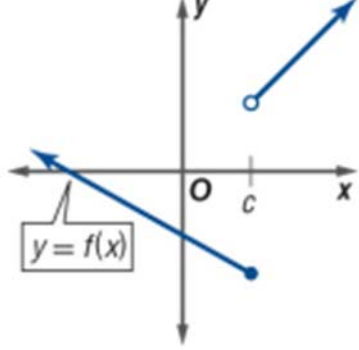
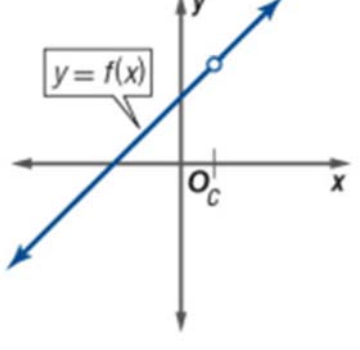
Discontinuity:

Concept: Can you draw the graph without lifting your pencil off the paper?

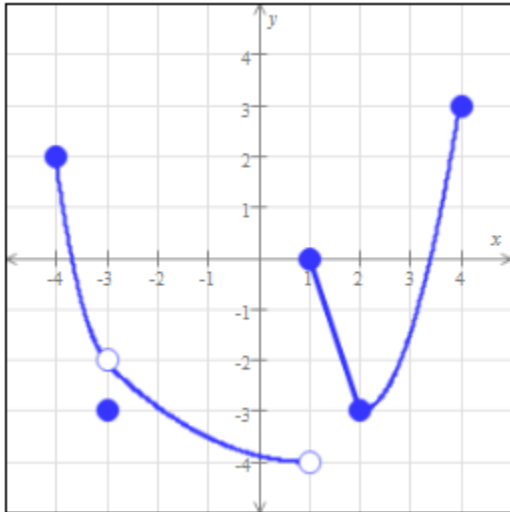
Yes => Function is continuous

No => Function is discontinuous.

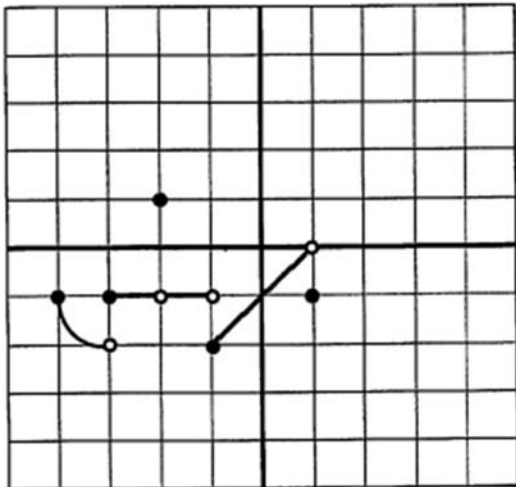
Type of Discontinuity:

Infinite	Jump	Point/Hole (Removable)
<p>A function has an infinite discontinuity at $x = c$ if the function value increases or decreases indefinitely as x approaches c from the left and right.</p> <p>Example</p> 	<p>A function has a jump discontinuity at $x = c$ if the limits of the function as x approaches c from the left and right exist but have two distinct values.</p> <p>Example</p> 	<p>A function has a removable discontinuity if the function is continuous everywhere except for a hole at $x = c$.</p> <p>Example</p> 

Ex 1: A function $h(x)$ is graphed below. At which values of x is h discontinuous? Describe the discontinuities.



Ex 2: A function $g(x)$ is graphed below. At which values of x is g discontinuous? Describe the discontinuities.



Ex 3: A function $f(x)$ is graphed below. At which values of x is f discontinuous? Describe the discontinuities.

