Bellwork 9/9

If a rock is thrown upward on the planet Mars with a velocity of 10 $\frac{m}{s}$, its height in meters t seconds later is given by:

$$y = 10t - 1.86t^2$$

1. Find the average velocity over the given time intervals:
   1. $[1, 1.1]$
   2. $[1, 1.01]$
   3. $[1, 1.001]$
2. Estimate the instantaneous velocity when $t = 1$.

reset

Bellwork 9/9 - Solutions

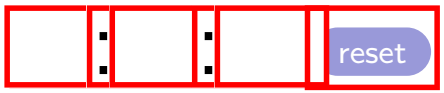
1. 1. $6.094 \frac{m}{s}$
   2. $6.2614 \frac{m}{s}$
   3. $6.27814 \frac{m}{s}$
2. $6.28 \frac{m}{s}$

Exercise 1

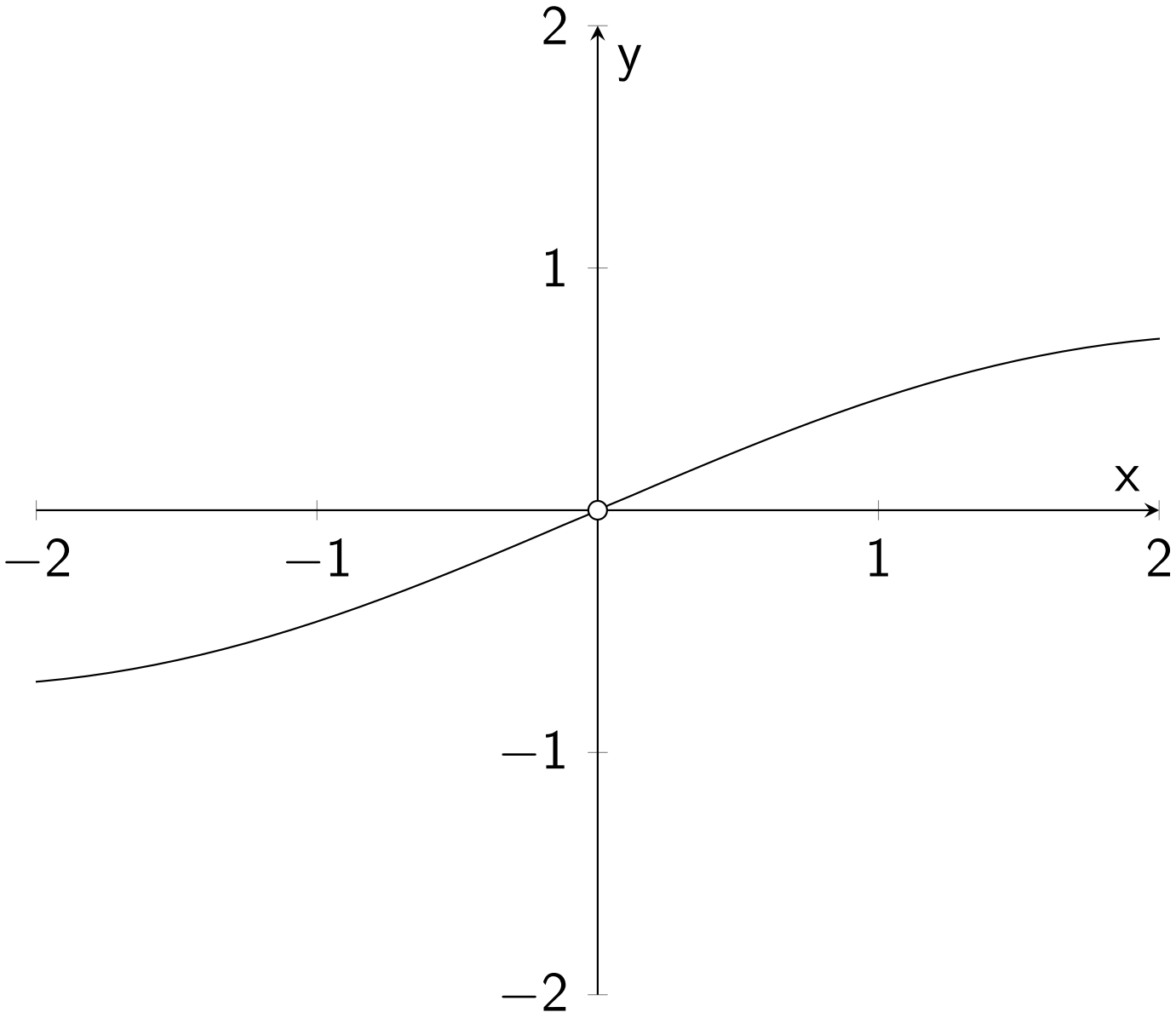
1. Graph $f(x) = \frac{1-\cos(x)}{x}$ on a calculator.
2. Fill in the table:

x	$f(x)$
0.5	
0.1	
0.01	
0.001	

3. Estimate $\lim_{x \to 0} \left[\frac{1 - \cos(x)}{x} \right]$



Exercise 1 - Solutions



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Exercise 1 - Solutions

2.

x	$f(x)$
-0.1	-0.05
-0.01	-0.005
0.01	0.005
0.1	0.05

3. From the table,

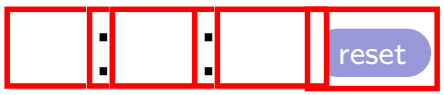
$$\lim_{x \to 0} \left[\frac{1 - \cos(x)}{x} \right] \approx \boxed{0}$$

Exercise 2

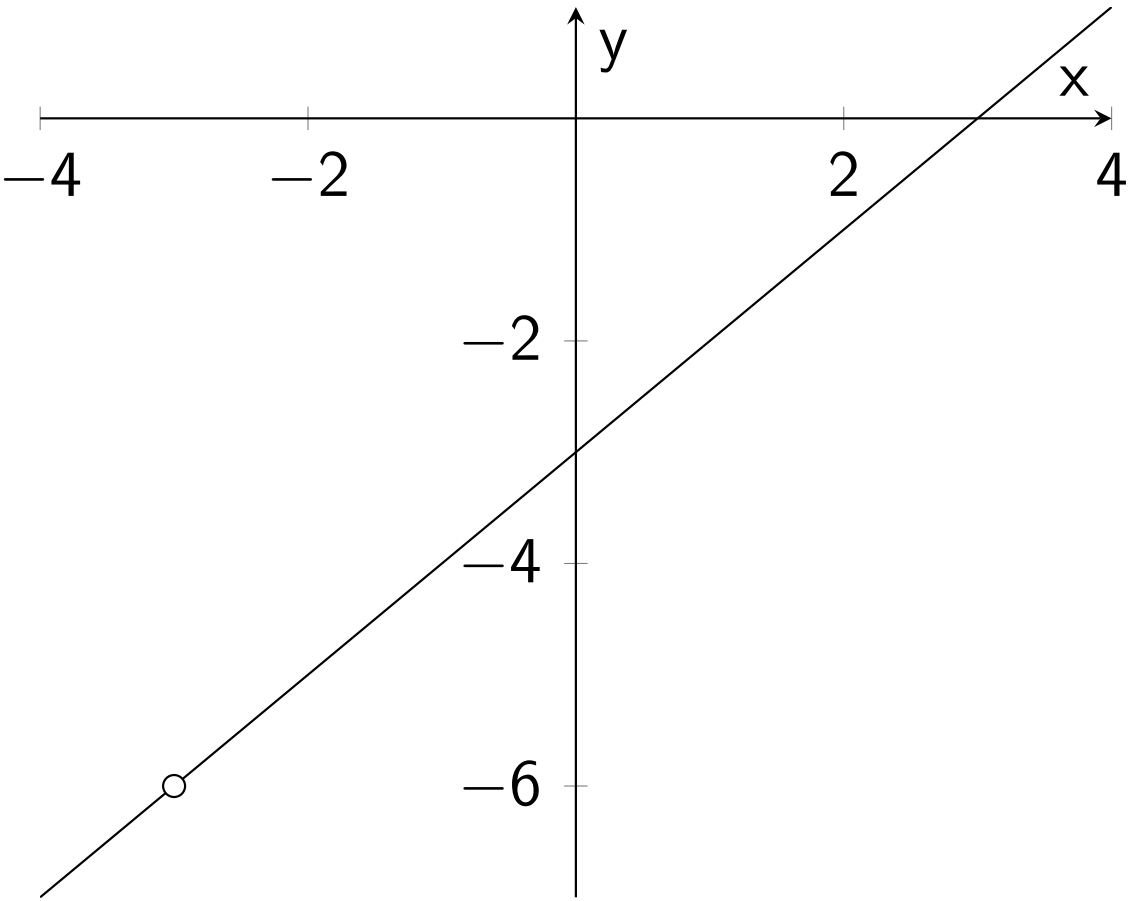
1. Graph $f(x) = \frac{x^2-9}{x+3}$ on a calculator.
2. Fill in the table:

x	$f(x)$
-3.1	
-3.01	
-2.99	
-2.9	

3. Estimate $\lim_{x \to -3} \left(\frac{x^2 - 9}{x + 3} \right)$



Exercise 2 - Solutions



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Exercise 2 - Solutions

2.

x	$f(x)$
-3.1	-6.1
-3.01	-6.01
-2.99	-5.99
-2.90.1	-5.9

3. From the table,

$$\lim_{x \to -3} \left(\frac{x^2 - 9}{x + 3} \right) \approx \boxed{-6}$$