

Introduction to Limits

Create a graph of $y = \frac{-3x^2 + 8x - 5}{x - 1}$.

Did you expect this graph? Why or why not? Set your window so $0 \leq x \leq 4.7$. Did this change your graph?

Insert $x = 1$ into the equation. What is the value of y ? Explain the value you see.

Is this graph just jumping over one point or many points?

Use the trace key and explain what you are seeing.

Build a set of table values in the neighborhood around 1.

X	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5
Y											

Are the table values jumping over just one value or many values?

When x between 0.9 and 1.1, between what two values do the y values stay between?

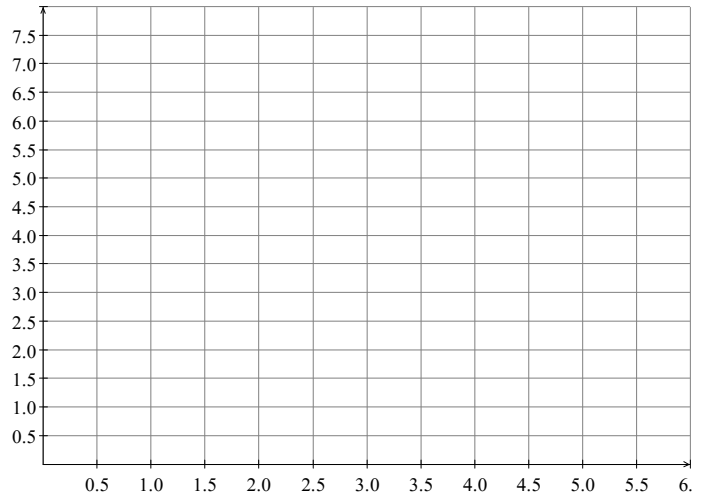
Let's move in a little closer on 1. Build a set of table values between $0.96 \leq x \leq 1.04$.

X	0.96	0.97	0.98	0.99	1.00	1.01	1.02	1.03	1.04
Y									

When $0.96 \leq x \leq 1.04$, between what two values do all the y values stay?

Let's move in a little closer on 1. Build a set of table values between $0.996 \leq x \leq 1.004$.

X	0.996	0.997	0.998	0.999	1.000	1.001	1.002	1.003	1.004
Y									



When $0.996 \leq x \leq 1.004$, between what two values do all the y values stay?

What value do you believe the function is jumping over when you are close to $x = 1$?

We call this the limit of the function $y = \frac{-3x^2 + 8x - 5}{x - 1}$ when x is approaching 1.

Study your last set of table values. Try to complete this statement:

"If x is within 0.001 units of 1 (but not equal to 1), then $f(x)$ is within _____ units of 2,"