Intro to Limits Worksheet

1. Use graphical and numerical methods to approximate $\lim_{x\to 3} f(x)$ where $f(x) = \dfrac{x^2 - 2x - 3}{x^2 - 4x + 3}$

x	$f(x)$
2.9	
2.99	
2.999	
3.001	
3.01	
3.1	

2. Use graphical and numerical methods to approximate $\lim_{x\to 2} f(x)$ where

$$f(x) = \begin{cases} x + 2 & x \leq 2 \\ 3x - 5 & x > 0 \end{cases}$$

x	$f(x)$
1.9	
1.99	
1.999	
2.001	
2.01	
2.1	

3. Use graphical and numerical methods to approximate $\lim_{x\to 0} f(x)$ where

$$f(x) = \begin{cases} \cos(x) & x \leq 0 \\ x^2 + 3x + 1 & x > 0 \end{cases}$$

x	$f(x)$
-0.1	
-0.01	
-0.001	
0.001	
0.01	
0.1	

4. For $f(x) = -7x + 2$ and $a = 3$, approximate the limit of the difference quotient,

$$\lim_{h\to 0} \frac{f(a+h) - f(a)}{h},$$

using $h = \pm 0.1, \pm 0.01$.

h	$\frac{f(3+h) - f(3)}{h}$
-0.1	
-0.01	
0.01	
0.1	