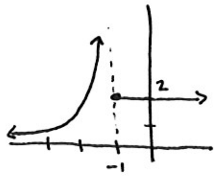
hw solutions
section 2.5

3.

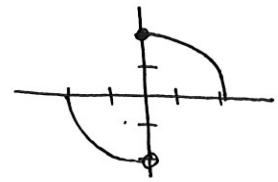


$\lim_{x \to -1^-} f(x) = \infty$

$\lim_{x \to -1^+} f(x) = 2$

$\lim_{x \to -1} f(x) = DNE$

7.



$\lim_{x \to 0^-} f(x) = -2$

$\lim_{x \to 0^+} f(x) = 2$

$\lim_{x \to 0} f(x) = DNE$

13. $\lim_{x \to 3} f(x) = \text{dne}$ (pg 126)

false, $\lim_{x \to 3} f(x) = 3$

17. $\lim_{x \to 2} f(x) = 1$ (pg 126)

false, $\lim_{x \to 2} f(x) = 2$

26. $\lim_{x \to 0^-} \frac{1}{x} = -\infty$

x	$-.5$	$-.1$	$-.01$
$1/x$	-2	-10	-100

33. $\lim_{x \to 1^-} \frac{1+x}{1-x} = \infty$

x	$.5$	$.9$	$.99$
$\frac{1+x}{1-x}$	3	19	199

35. $\lim_{x \to 2^-} \frac{x^2-4}{x-2} = 2+2 = 4$

$$\frac{x^2-4}{x-2} = \frac{(x-2)(x+2)}{x-2} = x+2$$

43. Where is $f(x)$ discontinuous?

$$f(x) = \begin{cases} x+5, & x<0 \\ 2, & x=0 \\ -x^2+5, & x>0 \end{cases}$$

discontinuous at $x=0$

b/c $\lim_{x \to 0} f(x) \neq f(0)$

59. Find where $f(x)$ is discontinuous.

$$f(x) = \frac{x^2-2x}{x^2-3x+2}$$

discontinuous when $x^2-3x+2=0$

$x^2-3x+2 = (x-1)(x-2)$

$x = 1, 2$

62. When is the graph discontinuous?

$t = 20, 40,$ and 60

The graph really means...

the continuous parts of the graph decrease b/c the company is using paper causing the inventory to decrease. But on $t=20, 40, \& 60$ the company receives new paper causing their inventory to jump up.

82. Use the IVT to find c where $f(c)=7$

$f(x) = x^2 - x + 1$ on $[-1, 4]$

check if can use IVT:

1) f contin ✓

2) $f(-1) = 3$

$f(4) = 13$

So $f(-1) < 7 < f(4)$ ✓

$f(c) = 7$

$c^2 - c + 1 = 7$

$c^2 - c - 6 = 0$

$(c-3)(c+2) = 0$

$c = 3$ or -2

$\boxed{c = 3}$