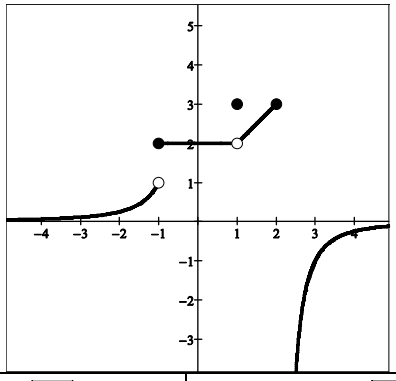
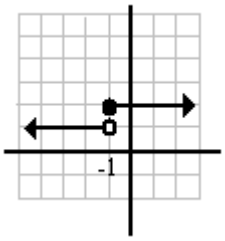
LIMITS WORKSHEET #4
SOLUTIONS SOLUTIONS SOLUTIONS SOLUTIONS SOLUTIONS

1.



a) $\lim_{x\to -1^-} f(x) = \boxed{1}$	b) $\lim_{x\to -1^+} f(x) = \boxed{2}$	c) $\lim_{x\to -1} f(x) = \boxed{\text{DNE}}$	d) $\lim_{x\to 1^-} f(x) = \boxed{2}$
e) $\lim_{x\to 1^+} f(x) = \boxed{2}$	f) $\lim_{x\to 1} f(x) = \boxed{2}$	g) $\lim_{x\to 2^-} f(x) = \boxed{3}$	h) $\lim_{x\to 2^+} f(x) = \boxed{-\infty}$
i) $\lim_{x\to 2} f(x) = \boxed{\text{DNE}}$	j) $\lim_{x\to -3} f(x) = \boxed{\frac{1}{9}}$	k) $\lim_{x\to 5} f(x) = \boxed{\frac{-1}{9}}$	l) $\lim_{x\to 1.5} f(x) = \boxed{\frac{5}{2}}$

3.



3a) Is f(x) continuous at x = –1?

$\boxed{\text{No, because } \lim_{x\to -1} f(x) \text{ DNE}}$

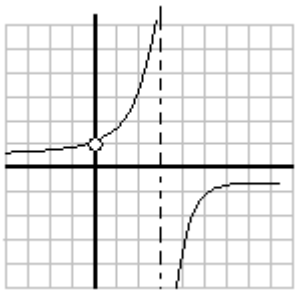
3b) What kind(s) of discontinuity does f(x) have?

$\boxed{\text{Jump Discontinuity}}$

3c) On what open interval(s) is f(x) continuous?

$\boxed{(-\infty,-1)[-1,\infty)}$

4.



4a) Is f(x) continuous at x = 3?

$\boxed{\text{No, because } f(3) \text{ DNE}}$

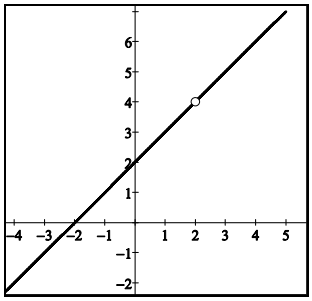
4b) What kind(s) of discontinuity does f(x) have?

$\boxed{\text{Point and Infinite Discontinuity}}$

4c) On what open interval(s) is f(x) continuous?

$\boxed{(-\infty,0),(0,3)(3,\infty)}$

5.



5a) Is f(x) continuous at. x = 2?

$\boxed{\text{No, because } f(2) \text{ DNE}}$

5b) What kind(s) of discontinuity does f(x) have?

$\boxed{\text{Point Discontinuity}}$

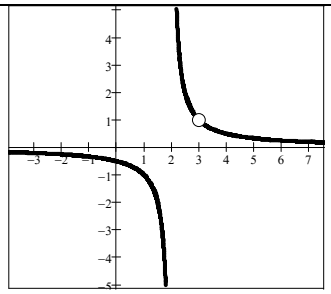
5c) On what open interval(s) is f(x) continuous?

$\boxed{(-\infty,2)(2,\infty)}$

5d) How would you remove the discontinuity?

$\boxed{\text{Let } f(2)=4}$

6.



6a) Is f(x) continuous at x =3?

No, because $f(3)$ DNE

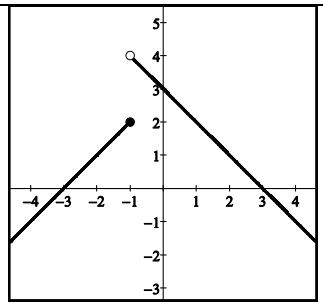
6b) What kind(s) of discontinuity does f(x) have?

Point and Infinite Discontinuity

6c) On what open interval(s) is f(x) continuous?

$(-\infty,2)(2,3)(3,\infty)$

7.



7a) Is f(x) continuous at x = –1?

No, because $\lim_{x\to -1} f(x)$ DNE

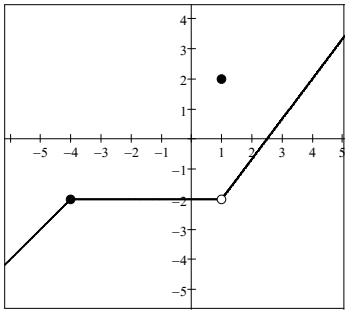
7b) What kind(s) of discontinuity does f(x) have?

Jump Discontinuity

7c) On what open interval(s) is f(x) continuous?

$(-\infty,-1)(-1,\infty)$

8.



8a) Is f(x) continuous at x = 1?

No, because $f(1)\neq \lim_{x\to 1} f(x)$ $[2\neq -2]$

8b) What kind(s) of discontinuity does f(x) have?

Point Discontinuity

8c) On what open interval(s) is f(x) continuous?

$(-\infty,1)(1,\infty)$

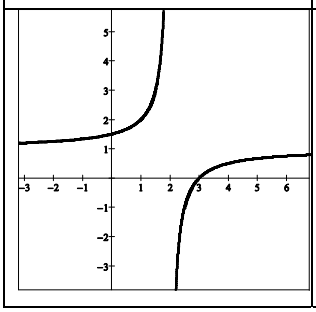
8d) Define f(x) as a piecewise function. See Below

$(1,-2)(4,2)\Rightarrow m=\dfrac{2-(-2)}{4-1}=\dfrac{4}{3}\Rightarrow y-y_1=m(x-x_1)\Rightarrow y-2=\dfrac{4}{3}(x-4)\Rightarrow y=\dfrac{4}{3}x-\dfrac{10}{3}\Rightarrow$

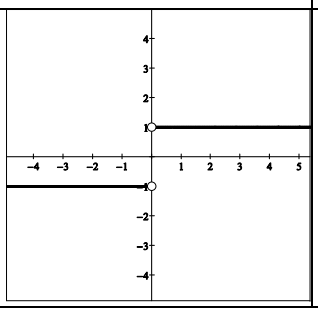
$$f(x)=\begin{cases} x+2 & x\le -4 \\ -2 & -4<x<1 \\ 2 & x=1 \\ \dfrac{4}{3}x-\dfrac{10}{3} & x>1 \end{cases}$$

Find each one–sided limit:

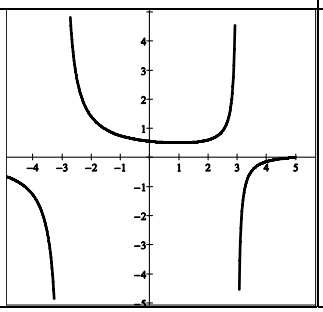
9. $\lim_{x\to 2^+}\dfrac{x-3}{x-2}=$ $-\infty$



10. $\lim_{x\to 0^-}\dfrac{|x|}{x}=$ -1

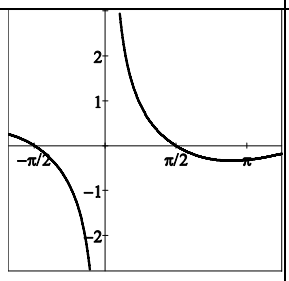


11. $\lim_{x\to 3^+}\dfrac{x-5}{x^2-9}$ $=-\infty$



12. $\lim_{x\to \pi^-}\dfrac{\cos x}{x}=$

$\dfrac{\cos\pi}{\pi}=\dfrac{-1}{\pi}$



13. $\lim_{x\to 3^-}\dfrac{x^2+2x-3}{x^2+x-6}=$

$\dfrac{9+2(3)-3}{9+(3)-6}=2$