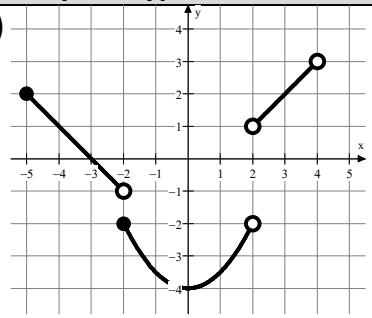
2.3 Practice – Limits (Graphically)

Name: **Answer Key**

Pre-Calculus

For 1-4, identify the x-values of each discontinuity, and write if it is removable or not. If it is nonremovable then classify the type.

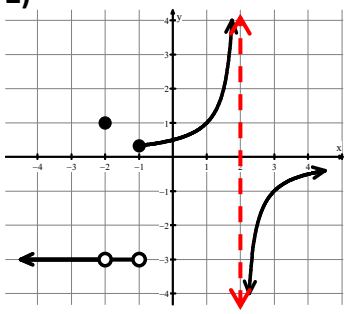
1)



Nonremovable jump discontinuity at $x = -2$.

Nonremovable jump discontinuity at $x = 2$.

2)

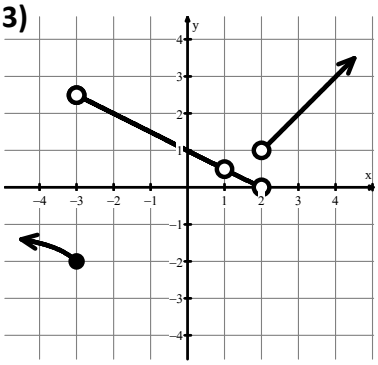


Removable discontinuity at $x = -2$.

Nonremovable jump discontinuity at $x = -1$.

Nonremovable infinite (vertical asymptote) discontinuity at $x = 2$.

3)

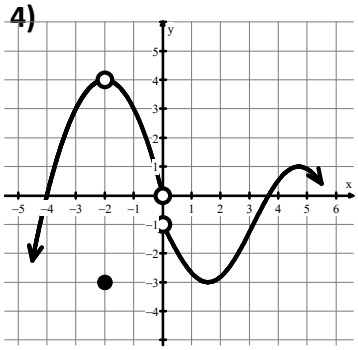


Nonremovable jump discontinuity at $x = -3$.

Removable discontinuity at $x = 1$.

Nonremovable jump discontinuity at $x = 2$.

4)



Removable discontinuity at $x = -2$.

Nonremovable jump discontinuity at $x = 0$.

For 5-8, give the value of each statement. If the value does not exist, write "*does not exist*" or "*undefined*."

5)

a. $\lim_{x \to -1^-} = 3$

b. $f(1) = 1$

c. $\lim_{x \to 0} = 0$

d. $\lim_{x \to 2^+} = 1$

e. $f(-1) = 1$

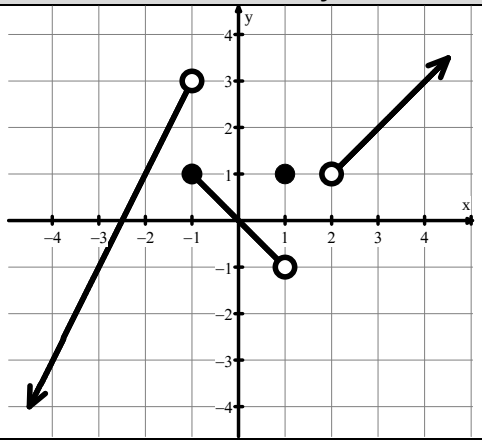
f. $\lim_{x \to -1^-} = -1$

g. $\lim_{x \to -1^+} = 1$

h. $f(2) =$ Does not exist

i. $\lim_{x \to 2} =$ Does not exist

j. $\lim_{x \to 1} =$ Does not exist



6)

a. $\lim_{x \to -3} = 0$

b. $f(1) =$ Does not exist

c. $\lim_{x \to 1} = -5$

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

e. $f(3) = -1$

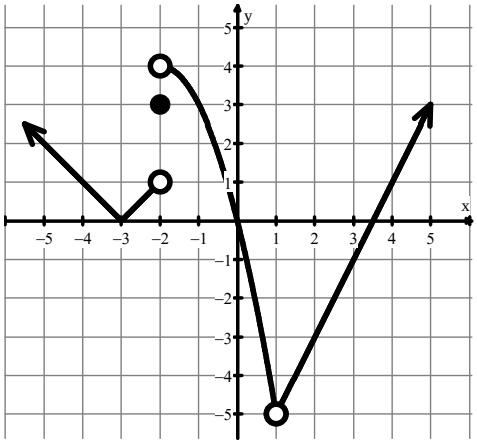
f. $\lim_{x \to -2^-} f(x) = 1$

g. $\lim_{x \to -2} =$ Does not exist

h. $f(-2) = 3$

i. $\lim_{x \to -1} = 3$

j. $\lim_{x \to 1^-} = -5$



7)

a. $\lim_{x\to 3^+} = 1$

b. $f(3) =$ Does not exist

c. $\lim_{x\to 0} = 1$

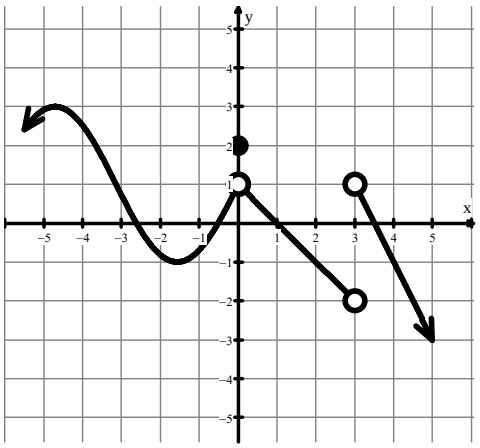
d. $\lim_{x\to 3} =$ Does not exist

e. $f(0) = 2$

f. $\lim_{x\to 3^-} = -2$

g. $\lim_{x\to 0^+} = 1$

h. $f(1) = 0$



8)

a. $\lim_{x\to -1^-} = 1$

b. $f(2) = 1$

c. $\lim_{x\to 2} = 4$

d. $\lim_{x\to -1} = 1$

e. $f(4) =$ Does not exist

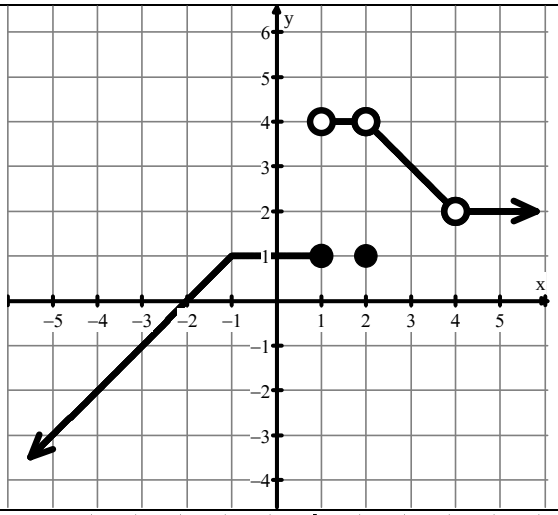
f. $\lim_{x\to 1^-} = 1$

g. $\lim_{x\to -1^+} = 1$

h. $f(1) = 1$

i. $\lim_{x\to 4} = 2$

j. $\lim_{x\to 1} =$ Does not exist



9)

a. $\lim_{x\to 3^-} f(x) = 4$

b. $f(-1) =$ Does not exist

c. $\lim_{x\to -3} f(x) = 4$

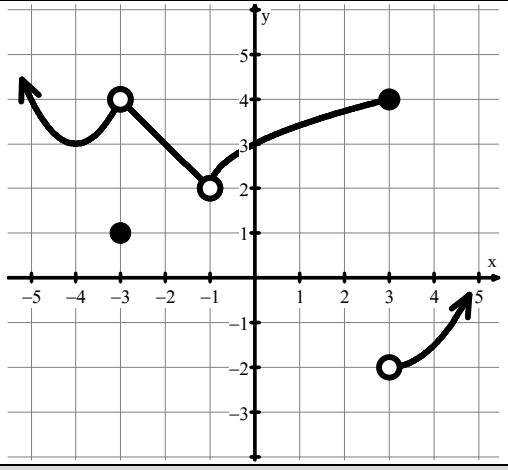
d. $\lim_{x\to -1} f(x) = 2$

e. $f(-3) = 1$

f. $\lim_{x\to 3^+} f(x) = -2$

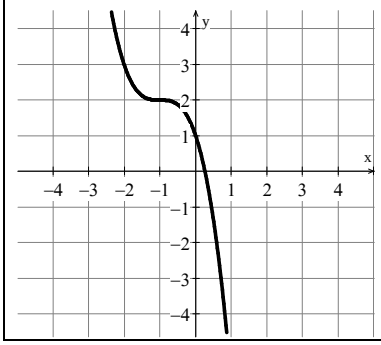
g. $f(3) = 4$

h. $\lim_{x\to 0} f(x) = 3$

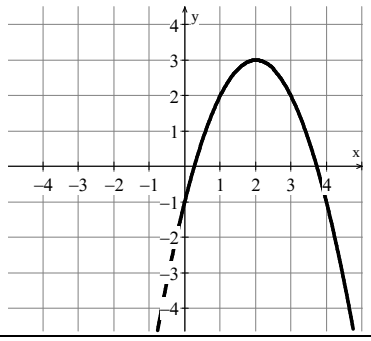


Skillz Review: Write the function of each graph using $f(x) = \sqrt{x}, f(x) = x^3, f(x) = |x|$, or $f(x) = x^2$.

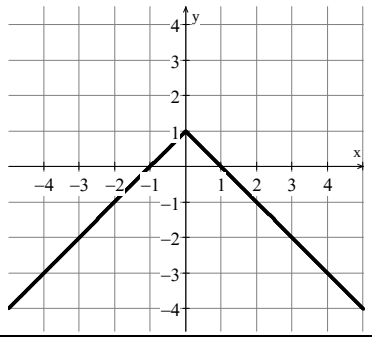
1) $f(x) =$



2) $f(x) =$



3) $f(x) =$



4) $f(x) =$