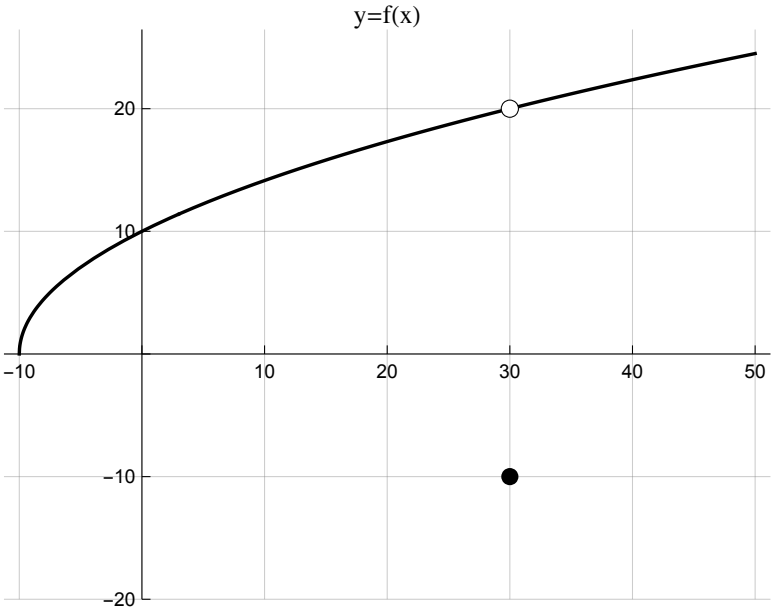
Math 118 Calculus Ia **Functions, Graphs, and Limits**

Do not use graphing tools or calculator to solve these problems. You can use technology later to check your work.

1. Read the function values and limits from the graph. If a function value or limit is *undefined*, just say so.



a. $f(0)$

b. $\lim_{x\to 0} f(x)$

c. $f(30)$

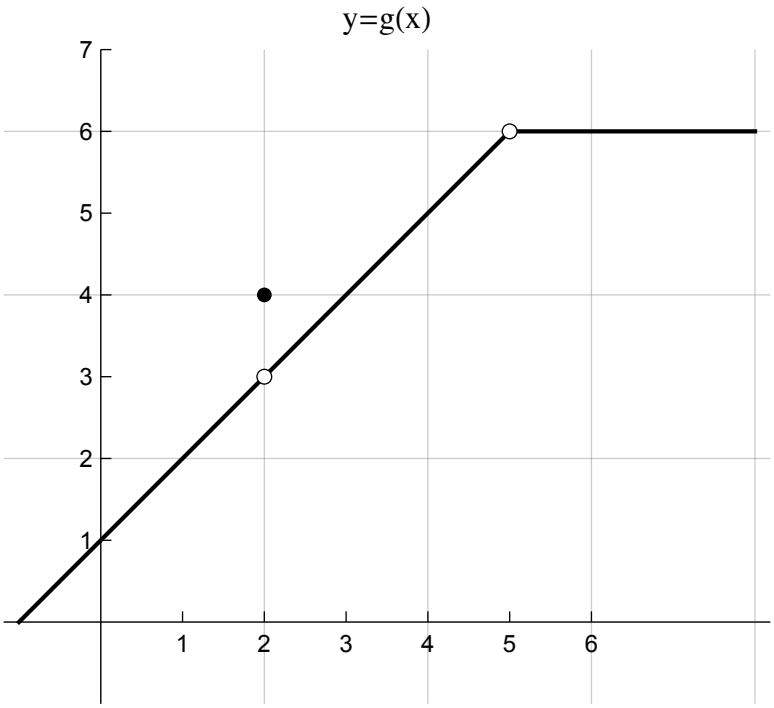
d. $\lim_{x\to 30} f(x)$

2. True/False (referring to the function f in the graph above)

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

b. $f(30) = \lim_{x\to 30} f(x)$

2. Again, read the function values and limits from the graph. If a value is undefined, just say so.



a. $g(0)$

b. $\lim_{x\to 0} g(x)$

c. $g(2)$

d. $\lim_{x\to 2} g(x)$

e. $g(5)$

f. $\lim_{x\to 5} g(x)$

3. True/False (referring to the function g in the graph above)

a. $g(0) = \lim_{x\to 0} g(x)$

b. $g(2) = \lim_{x\to 2} g(x)$

4. Use polynomial long division to help you factor the polynomial $x^3 - 12x^2 + 45x - 50$ (given that $x = 5$ is a zero)

5. Determine the *sign behavior* near the given zero, *without doing any graphing.* Good description would be: "Positive on both sides", "Negative on both sides", "Changes from negative to positive", or "Changes from positive to negative".

a. $(x+5)^2(x-1)$ near $x = -5$

b. $(x+5)^2(x-1)$ near $x = 2$

c. $(x-1)(x-2)^4$ near $x = 2$

c. $(x-1)(x-2)^4$ near $x = 1$

6. Use polynomial long division to help you factor the polynomial $x^3 - 7x^2 + 16x - 12$ (given that $x = 3$ is a zero)