

Name: _____

Class: _____

2.6b : Piecewise Functions part 2

For problems 1-3, evaluate each piecewise function at the given values of the independent variable.

1. $f(x) = \begin{cases} 6x - 1 & \text{if } x < 0 \\ 7x + 3 & \text{if } x \geq 0 \end{cases}$

a. $f(-3)$ b. $f(0)$ c. $f(4)$

2. $f(x) = \begin{cases} \frac{x^2 - 9}{x + 2} & \text{if } x \leq -1 \\ 6 & \text{if } x > -1 \end{cases}$

a. $f(-3)$ b. $f(1)$ c. $f(-1)$

3. $f(x) = \begin{cases} 2 + x & \text{if } x < -4 \\ -x & \text{if } -4 \leq x \leq 2 \\ \frac{1}{3}x & \text{if } x > 2 \end{cases}$

a. $f(2)$ b. $f(-3)$ c. $f(-5)$

4. When a diabetic takes long-acting insulin, the insulin reaches its peak effect on the blood sugar level in about three hours. This effect remains fairly constant for 5 hours, then declines, and is very low until the next injection. In a typical patient, the level of insulin might be modeled by the following function.

$$f(t) = \begin{cases} 40t + 100 & \text{if } 0 \leq t \leq 3 \\ 220 & \text{if } 3 < t \leq 8 \\ -80t + 860 & \text{if } 8 < t \leq 10 \\ 60 & \text{if } 10 < t \leq 24 \end{cases}$$

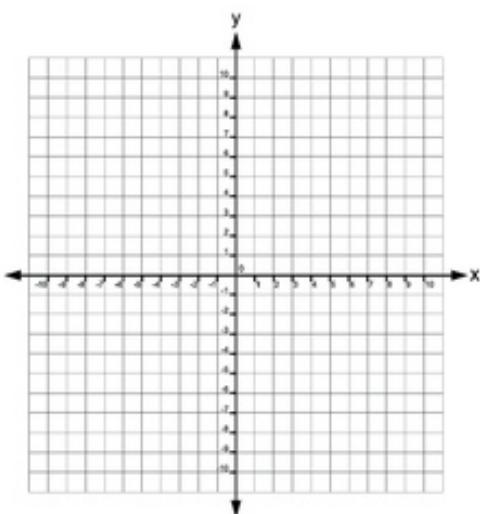
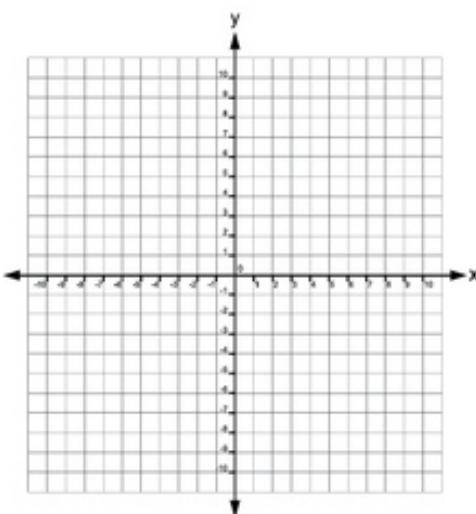
Here, $f(t)$ represents the blood sugar level at time t hours after the time of the injection. If a patient takes insulin at 6 am, find the blood sugar level at each of the following times.

- a. 7 am b. 11 am c. 3 pm d. 5 pm

For problems 5-14, graph each piecewise function.

5. $f(x) = \begin{cases} x + 3 & \text{if } x < -1 \\ 2x - 1 & \text{if } x \geq -1 \end{cases}$

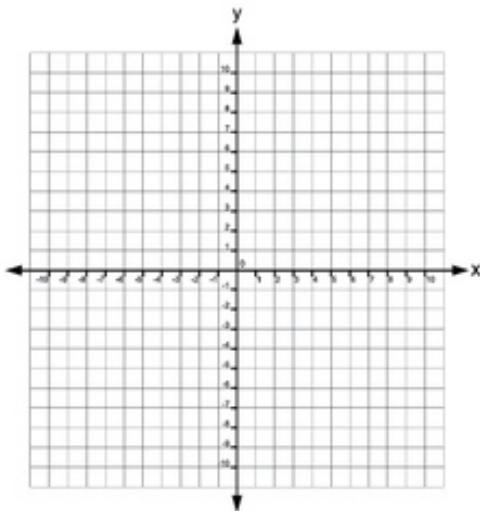
6. $f(x) = \begin{cases} x - 1 & \text{if } x \leq 3 \\ 2 & \text{if } x > 3 \end{cases}$



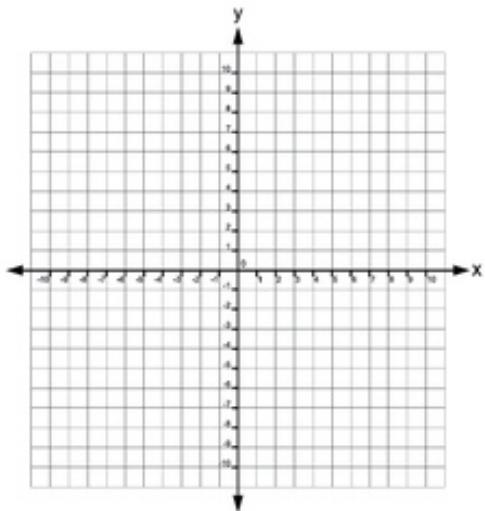
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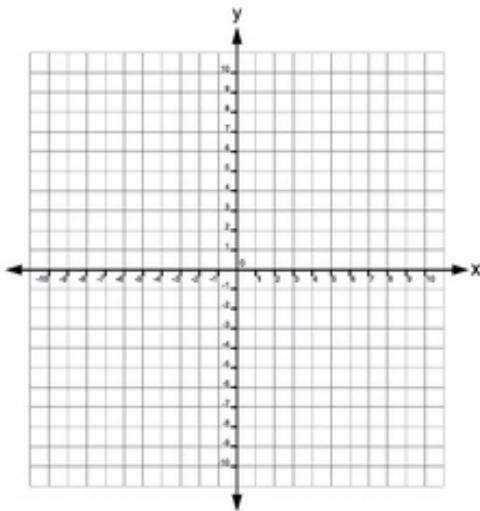
$$7. \ f(x) = \begin{cases} -1 & \text{if } x < 0 \\ x - 3 & \text{if } x \geq 0 \end{cases}$$



$$8. \ f(x) = \begin{cases} 4 - x & \text{if } x \leq 2 \\ 3x - 6 & \text{if } x > 2 \end{cases}$$



$$9. \ f(x) = \begin{cases} -2x & \text{if } x < -1 \\ 3x - 1 & \text{if } -1 \leq x \leq 2 \\ -\frac{1}{2}x & \text{if } x > 2 \end{cases}$$



$$10. \ f(x) = \begin{cases} 2 + x & \text{if } x < -2 \\ -x & \text{if } -2 \leq x \leq 1 \\ 0 & \text{if } x > 1 \end{cases}$$

