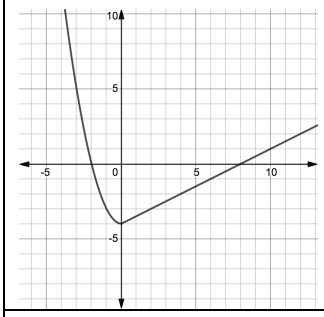
Circuit Training – Piecewise Functions (precalculus) **Name _____**

Directions: Begin in cell #1. Answer the question (show necessary work on this page or attach separate paper). Search for your answer. Call that cell #2 and proceed in this manner until you complete the circuit (get back to the beginning). No technology is needed!

# __1__ Answer: 5 $f(x) = \begin{cases} \lvert 2-x \rvert, & x \le 0 \\ 0.5x^2 - 5, & x > 0 \end{cases}$ $f(6) + f(-3)$	# _____ Answer: 9 $f(n) = \begin{cases} 3n+1, & \text{if } n \text{ is odd} \\ \frac{n}{2}, & \text{if } n \text{ is even} \end{cases}$ $f\left(f\left(f\left(f\left(f\left(f(f(f(42)))\right)\right)\right)\right)\right)$ Look up The Collatz Conjecture if this piques your interest!
# _____ Answer: 8 $f(x) = \begin{cases} -x^3 + 4, & x < -2 \\ -\frac{1}{2}x + 11, & x \ge -2 \end{cases}$ $f^{-1}(10)$	# _____ Answer: 13 Find the minimum value of the function $w(x)$. $w(x) = \begin{cases} x^2 + 4x + 1, & x \le -1 \\ x - 1, & x > -1 \end{cases}$
# _____ Answer: 18 $g(x) = \begin{cases} \frac{x}{2}, & x = -2 \\ 2^{x+3}, & x \ne -2 \end{cases}$ $g(-2) - g(0)$	# _____ Answer: 7 $w(x) = \begin{cases} x^2 + 4x + 1, & x \le -1 \\ x - 1, & x > -1 \end{cases}$ Is $w(x)$ continuous at $x = -1$? If yes, go to answer 10. If no, go to answer 5.
# _____ Answer: -16 Solve $f(x) = 5$. There are four solutions. Find the sum of the solutions. $f(x) = \begin{cases} -x^2 - 6x, & x < 1 \\ \frac{1}{2}x, & x > 1 \\ 5, & x = 1 \end{cases}$	# _____ Answer: 6 $g(x) = \begin{cases} \frac{x+3}{x+2}, & x \ne -2 \\ \frac{1}{4}, & x = -2 \end{cases}$ $g(0) + g(-2) + g(2)$

_____ Answer: -11

The graph shows the piecewise function $f(x) = \begin{cases} x^2 + b\,, x \le 0 \\ ax + c, x > 0 \end{cases}$. Evaluate $\frac{b+c}{a}$.



_____ Answer: -9

$$p(x) = \begin{cases} 9\sin x\,, & x < \frac{\pi}{2} \\ 2 + \cos x\,, & \frac{\pi}{2} \le x < \pi \\ \tan x\,, & x \ge \pi \end{cases}$$

$$\frac{p\left(\frac{2\pi}{3}\right) + p\left(\frac{\pi}{6}\right)}{p\left(\frac{5\pi}{4}\right)}$$

_____ Answer: -3

$$f(x) = \begin{cases} 5e^{x+3}\,, & x \le 0 \\ \ln x\,, & x > 0 \end{cases}$$

$$f(-3) + f(e^3)$$

_____ Answer: 12

$$w(x) = \begin{cases} \frac{|x-5|}{x-5}\,, & x \ne 5 \\ x^3 - 121\,, & x = 5 \end{cases}$$

$$w(2\pi) + w(5) + w(-e)$$

_____ Answer: 10

Find b so that $f(x)$ is a continuous function.

$$f(x) = \begin{cases} bx + 1, & x < 2 \\ \frac{5}{2}x - 6\,, & x \ge 2 \end{cases}$$

_____ Answer: 1

$$p(x) = \begin{cases} 5x - 3, & x < -2 \\ x^2 + 2x + 7, & -2 \le x < 2 \\ x^3 + 8, & x \ge 2 \end{cases}$$

What is the y-intercept of $p(x)$?

_____ Answer: 2

$$f(x) = \begin{cases} x - 5\,, & x < 0.5 \\ 3x + 1\,, & x \ge 0.5 \end{cases}$$

x	-7	-2	2	7
$g(x)$	0.5	-3	0	-6

$$g\big(f(2)\big) + f(g(2))$$

_____ Answer: -1

Find a so that $h(x)$ is a continuous function.

$$h(x) = \begin{cases} \frac{x^2 + 7x - 30}{x - 3}, & x \ne 3 \\ a\,, & x = 3 \end{cases}$$

_____ Answer: 3

$$w(t) = \begin{cases} 4t^2 + 1\,, & t < -1 \\ t + 3\,, & t \ge -1 \end{cases}$$

The equation $w(t) = 17$ has two real solutions. Find the sum of the solutions.

_____ Answer: 4

$$v(t) = \begin{cases} [\![t]\!]\,, & t > 1 \\ |t - 3|\,, & t \le 1 \end{cases}$$

$$v(-2) + v(0) + v(1.42)$$