

ALGEBRA ZONE

1. Find the equation of the line through the points $(1, 5)$ and $(7, 2)$. $y = -\frac{1}{2}x + \frac{9}{2}$

2. Simplify: $\frac{2x^2 - 8x}{x^2 + 2x - 24}$ $\frac{2x}{x+6}$

3. Simplify: $\frac{5-x^2+4\sqrt{x}}{\sqrt{x}}$ $5x^{-1/2} - x^{3/2} + 4$

4. Simplify: $\frac{\frac{5}{x}-2}{\frac{4-\frac{1}{x}}{3x}}$ $\frac{15-6x}{12x-1}$

5. Solve: $\frac{2}{x} + \frac{5}{x+5} = 0$ $x = -\frac{10}{7}$

6. Solve: $\sqrt{x+12} = x+6$ $x = -3$

FUNCTION ZONE

1. Given $f(x) = \frac{\sqrt{x^2+16}}{x+8}$, find $f(-3)$ $f(-3) = 1$

2. Given $g(t) = 2t^2 - 7t + 12$, find $g(t+7)$. Simplify. $g(t+7) = 2t^2 + 21t + 61$

3. Find all x -values not in the domain of $f(x) = \frac{5}{(2x-14)(3x^2+27)}$. $x = 7$

4. Find the domain of $g(x) = \sqrt{5-2x}$ $\left(-\infty, \frac{5}{2}\right]$

5. If $f(x) = 4x^2 - 4x$ and $g(x) = \sqrt[3]{2x^2}$, find $(f \circ g)(2)$ $x = 8$

6. If $f(x) = \frac{2x-4}{2-x}$, find $f^{-1}(3)$. $f^{-1}(3) = 2$

EXP AND LOG ZONE

1. Factor: $e^x(2x + x^2) + e^x$ $e^x(x + 1)^2$

2. Expand: $\ln\left(\frac{2x^2y^3}{(x+7)^9}\right)$ $\ln 2 + 2 \ln x + 3 \ln y - 9 \ln(x + 7)$

3. Solve for x: $\log_2(x + 3) - \log_2(x - 1) = 1$ $x = 5$

4. Solve for x: $4e^{3x} - 12 = 0$ $x = \frac{\ln 3}{3}$

5. Solve for x: $4e^x - x^2e^x = 0$ $x = -2, 2$

6. Simplify: $\ln e^{7x} - e^{2 \ln x}$ $7x - x^2$

TRIG ZONE

1. $\sin\left(\frac{7\pi}{4}\right)$ $-\frac{\sqrt{2}}{2}$

4. $\cot\left(\frac{11\pi}{6}\right)$ $-\sqrt{3}$

2. $\cos\left(-\frac{\pi}{3}\right)$ $\frac{1}{2}$

5. $\sec\left(\frac{-5\pi}{6}\right)$ $-\frac{2\sqrt{3}}{3}$

3. $\tan\left(\frac{5\pi}{4}\right)$ 1

6. $\csc(\pi)$ DNE

2	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	1
-2	$-\frac{1}{2}$	$-\frac{\sqrt{2}}{2}$	$-\frac{\sqrt{3}}{2}$	-1
$\sqrt{2}$	$\sqrt{3}$	$\frac{2\sqrt{3}}{3}$	$\frac{\sqrt{3}}{3}$	0
$-\sqrt{2}$	$-\sqrt{3}$	$-\frac{2\sqrt{3}}{3}$	$-\frac{\sqrt{3}}{3}$	DNE

RULES:

- No more than 2 people in a box working on a problem at a time.
- All students must work on at least one problem per Zone.
- One shooter at a time. Each shooter gets one try, then back of the line.
- DON'T SHOOT EACH OTHER WITH THE NERF GUNS
- Each team allowed 2 hints per round.