Show work!

- Solve the inequality $|2x+5| > 1$ and plot the region on the number line. Remember both sides.

$2x+5 > 1$

$2x+5-5 > 1-5$

$\frac{2x}{2} > \frac{-4}{2}$

$x > -2$

$-(2x+5) > 1$

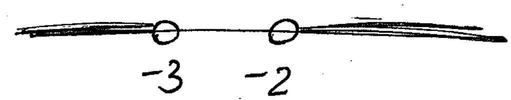
$-2x-5 > 1$

$-2x-5+5 > 1+5$

$\frac{-2x}{-2} > \frac{6}{-2}$

$x < -3$

$(-\infty,-3)\cup(-2,\infty)$



- Give an equation for the line perpendicular to the line that goes through (0,1) and (3,2). This perpendicular line should go through (0,1).

$m = \frac{2-1}{3-0} = \frac{1}{3} \Rightarrow m_\perp = -3$

$y - y_1 = m_\perp(x - x_1)$

$y - 1 = -3(x-0) = -3x$

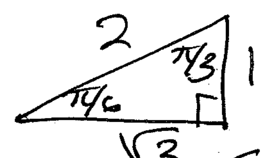
$\boxed{y = -3x+1}$

- Simplify and then evaluate the limit: $\lim_{x\to 2} \frac{2(x^2-4)}{x-2} + 1$

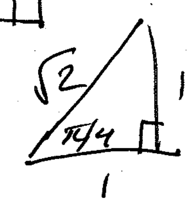
$\lim_{x\to 2} \frac{2(x^2-4)}{x-2} + 1 = \lim_{x\to 2} \frac{2(x+2)\cancel{(x-2)}}{\cancel{(x-2)}} + 1$

$= \lim_{x\to 2} 2(x+2) + 1 = \underbrace{2\underbrace{(2+2)}_{4}}_{8} + 1 = \boxed{9}$

- Use the identity $sin(A+B) = sin(A)cos(B) + cos(A)sin(B)$ to evaluate $sin(\frac{5\pi}{12})$.



$\frac{5\pi}{12} = \frac{2\pi}{12} + \frac{3\pi}{12} = \underbrace{\frac{\pi}{6}}_{A} + \underbrace{\frac{\pi}{4}}_{B}$



$\sin\left(\frac{5\pi}{12}\right) = \sin\left(\frac{\pi}{6}\right)\cos\left(\frac{\pi}{4}\right) + \cos\left(\frac{\pi}{6}\right)\sin\left(\frac{\pi}{4}\right)$

$= \left(\frac{1}{2}\right)\left(\frac{1}{\sqrt{2}}\right) + \left(\frac{\sqrt{3}}{2}\right)\left(\frac{1}{\sqrt{2}}\right) = \boxed{\frac{1}{\sqrt{2}}\left(\frac{1}{2} + \frac{\sqrt{3}}{2}\right)}$