

Name: Solution

MAC1105 Section 1A26

Quiz 7

Please show all of your work in a NEAT and ORGANIZED fashion.

1. (3 points) Solve the inequality and write the solution set in interval notation.

$$\begin{aligned}\frac{1}{x-5} - \frac{1}{x+3} &\leq 0 & \text{LCD} = (x-5)(x+3) \\ \frac{x+3}{(x-5)(x+3)} - \frac{x-5}{(x-5)(x+3)} &\leq 0 \\ \frac{\cancel{x+3} - \cancel{x+5}}{(x-5)(x+3)} &\leq 0 \\ \frac{8}{(x-5)(x+3)} &\leq 0\end{aligned}$$

Number line diagram showing critical points at -3 and 5. The sign is positive for $x < -3$, negative for $-3 < x < 5$, and positive for $x > 5$. The solution set is $(-3, 5)$.

2. (4 points) Solve the inequality and write the solution set in interval notation.

$$\begin{aligned}|4x-5| &> 7 & |4x-5| = 4x-5 \text{ or } -4x+5 \\ 4x-5 &> 7 & -4x+5 > 7 \\ 4x &> 12 & -4x > 2 \\ x &> 3 & x < -\frac{1}{2}\end{aligned}$$

Number line diagram showing critical points at $-\frac{1}{2}$ and 3. The solution set is $(-\infty, -\frac{1}{2}) \cup (3, \infty)$.

3. (3 points) Find the distance between the points $(-3, 1)$ and $(2, 4)$.

$$\begin{aligned}d &= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \\ &= \sqrt{(2 - (-3))^2 + (4 - 1)^2} \\ &= \sqrt{5^2 + 3^2} \\ &= \sqrt{25 + 9} \\ &= \sqrt{34}\end{aligned}$$