NAME _____

MATH 113-08: FALL 2020	QUIZ 1

You are allowed one page of notes and a calculator. No phones. More than 25pts to earn. Please BOX *your answer to each question. At least 25pts to earn here. Thanks!*

Problem 1: (2pts) Find the equation of a line given that contains points $(2, -1)$ and $(3, 5)$.

Problem 2: (2pt) Let $A = \{x \in \mathbb{R} \mid |x - 1| > 3\}$. Write A in interval notation (use union if needed).

Problem 3: (2pt) Find the domain of the expression $\dfrac{1}{\sqrt{10 - 2x}}$. Provide answer in interval notation.

Problem 4: (2pt) Assume $x, y > 0$ and use laws of algebra to determine A, B as indicated below:

$$x^A y^B = \left(\frac{y^{-2}}{x^{-1} y^3} \sqrt[3]{xy} \right)^3$$

Problem 5: (2pt) Peform the addition and simplify the resulting expression.

$$\frac{3 - x}{7 - x} + 2$$

Problem 6: (4pt) **Factor** each $f(x)$ given below completely over $\mathbb{R}$ and **solve** $f(x) = 0$.

(a.) $x^2 - 9x + 20$,

(b.) $(x^2 + 6x + 9)(x^2 + 4x + 5)$.

Problem 7: (6pt) For each quadratic polynomial $f(x)$ given below, complete the square and find all real or complex solutions of $f(x) = 0$:

(a.) $f(x) = 2x^2 - 20x + 50$,

(b.) $f(x) = x^2 - 12x + 39$.

Problem 8: (4pt) **Choose one** of the the following equations to solve over $\mathbb{R}$,

(a.) $|2x+1| = 11$

(b.) $\sqrt{x+1} - \sqrt{x-4} = 1$

Problem 9: (4pts) Solve the following inequality using an appropriate technique. Show your work and write the answer using interval notation (you might need to use $\cup$ for union)

$$\frac{2}{x^2+2x-15} > 0$$

Problem 10: (2pt) Find the area of the triangle with vertices $P = (1, 2)$, $Q = (1, 7)$ and $R = (6, 4)$. Show your work including appropriate diagrams.

Problem 11: (2pts) Use completing the square and algebra as needed to place each circle equation below into standard form. Find the center and radius of the circle.

$x^2 - 4x + y^2 + 12y = 2$