R U Ready 4 MTH 111?

Below are some skills you should have BEFORE taking MTH 111:

1) Use the graph of the function \( f(x) \) below to answer the questions.

- **a)** State the domain using interval notation.
- **b)** State the range using interval notation.
- **c)** Evaluate \( f(2) \).
- **d)** Solve \( f(x) = 1 \)
- **e)** Solve \( f(x) \leq -1 \)

2) Algebraically determine the domain of \( \sqrt{x + 5} \). Sketch a graph and clearly label both \( x \) and \( y \) intercepts.

3) Find a linear function \( f(x) \) such that \( f(-2) = 11 \) and \( f(4) = -1 \).

4) Write \( y = x^2 - 6x + 7 \) in vertex form by completing the square. Identify the vertex. \( y = a(x - h)^2 + k \)

5) Solve \( | -2x + 7 | > 1 \) both symbolically and graphically. State the solution set using interval notation and sketch your graph to prove it.
6) Solve $\sqrt{2x + 18} + 3 = x$ both algebraically and graphically.

7) Solve $-5 < -2x + 3 < 6$ algebraically and graph your solution set on a number line.

8) Solve for $x$ by using the quadratic formula $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$$5x^2 - 4x = -1$$

9) Solve for $x$ by factoring: $x^2 - 5x + 6 = 0$

10) Solve for $x$: $6|x + 3| - 3 = 21$

11) Solve for $x$: $1 - \frac{3}{x-1} = \frac{-6}{x^2-1}$

Simplify:

12) $\frac{2x+6}{x^2-5x+6} + \frac{x^2+4x+4}{4x-8}$

13) $\frac{x+2}{x-1} - \frac{x+3}{x+4}$

14) $\frac{1}{3} + \frac{2}{x}$
1. a) [-4, 4)
   b) [-5, 3)
   c) f(3) = 1
   d) f(x) = 1 \& 1, 2, 3, 3
   e) [-4, 0]

2. \[ x + 5 \geq 0 \]
   \[ x \geq -5 \]

3. \[ f(-2) = 1 \]
   \[ f(4) = -1 \]
   \[ y = mx + b \]
   \[ -1 = (-2)(4) + b \]
   \[ -1 = -8 + b \]
   \[ b = 7 \]
   \[ f(x) = -2x + 7 \]

4. \[ x^2 - 6x + 9 - 9 + 7 \]
   \[ y = (x - 3)^2 - 2 \]
   \[ V(3, -2) \]

5. \[ | -3x + 7 | > 1 \]
   \[ \{(-\infty, 3) \cup (4, \infty) \}

6. \[ \sqrt{2x + 18} + 3 = x \]
   \[ \frac{1}{3} \left( \sqrt{2x + 18} \right)^2 = (x - 3)^2 \]
   \[ 2x + 18 = x^2 - 6x + 9 \]
   \[ -2x - 18 = -2x - 18 \]
   \[ 0 = x^2 - 8x - 9 \]
   \[ 0 = (x - 9)(x + 1) \]
   \[ x = 9, -1 \]
   Which... only \( x = 9 \)

7. \[ -5 < -2x + 3 < 6 \]
   \[ \frac{-5}{-2} < \frac{-2x}{-2} < \frac{6}{-2} \]
   Flips!

   \[ 4 > x > \frac{3}{2} \]
   on

   \[ \frac{3}{2} < x < 4 \]