Answer on Question #44022, Math, Algebra

1. Determine domain and range of the function:

$$f(x) = -\sqrt{-2x + 3}$$

Determine the domain. To get a real number (-2x + 3) must not be negative:

$$-2x + 3 \geq 0$$

$$-2x \geq -3$$

So, the function is defined when:

$$x \leq {}^{3}/_{2}$$

The domain of the function is:

$$x \in (-\infty; {}^{3}/_{2}]$$

The value of the square root could not be below zero. Thus, the range of the function is:

$$f(x) \in (-\infty; 0)$$

2. Determine domain and range of the function:

$$f(x) = x^2 + \frac{x + 2}{x^2 - x - 2}$$

Determine the domain:

$$x^2 - x - 2 \neq 0$$

$$(x + 1)(x - 2) \neq 0$$

$$x \neq -1; x \neq 2$$

The function has two vertical asymptotes: $x \neq -1$ and $x \neq 2$. The domain of the function is:

$$x \in (-\infty; -1) \cup (-1; 2) \cup (2; \infty)$$

The range of the function is:

$$f(x) \in (-\infty; 0) \cup (2.37; \infty)$$