

ANSWERS CHAPTER 11.5

MATH 132 WI01

4.

$$(-\infty, -7] \cup [2, \infty)$$

or

$$x \leq -7, x \geq 2$$

18.

$$(-\infty, -1) \cup (0, 1)$$

or

$$x < -1, 0 < x < 1$$

24.

$$(-\infty, -0.5]$$

or

$$x \leq -0.5$$

28.

Proof. After cutting a uniform strip of width x out of the forest we remain with an area of $(1-2x)(2-2x)$ of forest; hence we need to solve the inequality

$$(1-2x)(2-2x) = 2-2x-4x+4x^2 = 2-6x+4x^2 \geq \frac{3}{4} \iff$$

$$4x^2 - 6x + 2 - \frac{3}{4} = 4x^2 - 6x + \frac{5}{4} \geq 0$$

solving the left-hand sided equation we get as solutions $\frac{10}{8} = \frac{5}{4}$ and $\frac{2}{8} = \frac{1}{4}$; the solution for the inequality is then

$$x \leq \frac{1}{4} \text{ or } x \geq \frac{5}{4}$$

but since we cannot cut more than a $\frac{1}{2}$ wide strip, the second part is unusable.

Result: $x \leq \frac{1}{4} = 0.25$ (of course, x is also positive ...) □