

**Quiz #2**

1. In this problem, the function  $p(x)$  will always refer to the function defined by the formula:

$$p(x) = \frac{k \cdot x}{x + k},$$

where the letter  $k$  refers to a fixed, constant number.

**NOTE:** In this problem you **SHOULD SIMPLIFY YOUR ANSWERS** as much as possible.

- (a) **(1 point)** Evaluate:  $p(k)$ .

- (b) **(1 point)** Evaluate:  $p\left(\frac{1}{k}\right)$ .

- (c) **(1 point)** What is the DOMAIN of the function  $p(x)$ ?

- 2.** In this problem, the functions  $f(x)$  and  $g(x)$  will always refer to the functions defined by the formulas:

$$f(x) = -(x-1)(x-7) \quad \text{and} \quad g(x) = 1 + \sqrt{x+7}.$$

The domain of  $f(x)$  consists of all numbers and the domain of  $g(x)$  consists of all numbers greater than or equal to  $-7$ .

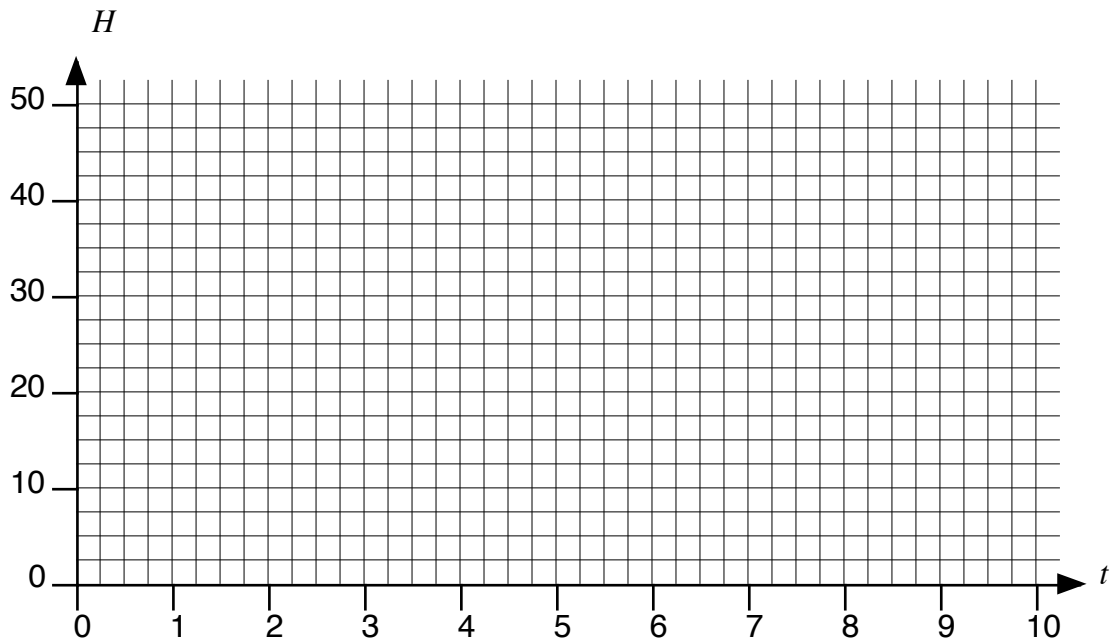
- (a)** **(1 point)** Write down a formula for the composite function  $f(g(x))$ .

- (b)** **(1 point)** Write down a formula for the composite function  $g(f(x))$ .

3. At noon, a fly lands on the end of the blade of a windmill just as this blade points straight up. The fly sits and rides the windmill blade for three revolutions. Suppose that the windmill is turning at a rate of 30 revolutions per hour, each blade of the windmill is 12 feet long and the tip of the blade clears the ground by 25 feet.

(a) (1 point) How high is the fly above the ground at noon?

(b) (2 points) Use the axes provided below to draw a graph showing the height,  $H$ , of the fly above the ground  $t$  minutes after noon.



(c) (2 points) Write down a formula for  $H(t)$ , the height of the fly above the ground  $t$  minutes after noon.