



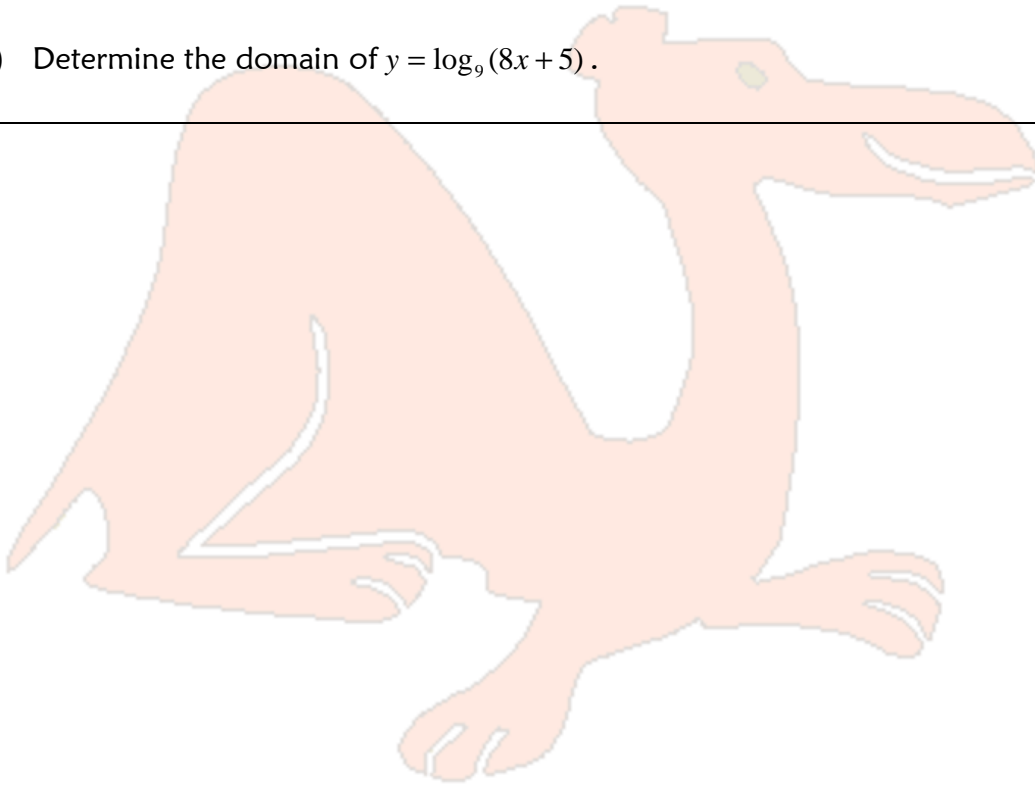
# CAMI Mathematics: Grade 12

## 12.1 Exponential and logarithmic functions

### 12.1 Logarithmic function

#### 1. Properties of a logarithmic function

- (a) If  $y = \log_a x$  passes through (5; 1), determine the value of  $a$ .
- (b) If  $y = \log_5 x$ , calculate the x-intercept.
- (c) If  $y = \log_a x$  passes through (9;-2), determine the value of  $a$ .
- (d) Determine the domain of  $y = \log_7(3x - 1)$ .
- (e) Determine the domain of  $y = \log_9(8x + 5)$ .





## MEMO

### 1. Properties of a logarithmic function [6.7.5]

(a)  $y = \log_a x$   
 $1 = \log_a 5$   
 $\therefore a = 5$

(b)  $y = \log_5 x$   
 $y = 0:$   
 $0 = \log_5 x$   
 $5^0 = x$   
 $\therefore x = 1$

(c)  $y = \log_a x$   
 $-2 = \log_a 9$   
 $a^{-2} = 9$   
 $a^{-2} = (3^{-1})^{-2}$   
 $a^{-2} = \left(\frac{1}{3}\right)^{-2}$   
 $\therefore a = \frac{1}{3}$

(d)  $y = \log_7(3x-1).$   
 $3x-1 > 0$   
 $3x > 1$   
 $\therefore x > \frac{1}{3}$

*Domain* :  $x > \frac{1}{3}$

(e)  $y = \log_9(8x+5).$   
 $8x+5 > 0$   
 $8x > -5$   
 $\therefore x > -\frac{5}{8}$

*Domain* :  $x > -\frac{5}{8}$

