

## WORKSHEET 9

MATH 101

*Fulbright University, Ho Chi Minh City, Vietnam*

**Question 1.**     *(1) Find a formula for  $(a^x)'$  where  $a$  is a real number.*

*(2) Find a formula for  $(x^x)'$*

**Question 2.** *State all the cases when you can apply L'Hospital rule.  
What is the rule?*

**Question 3.** *Evaluate the following*

$$(1) \lim_{x \rightarrow 0} \left( \frac{1}{x} - \frac{1}{\sin x} \right)$$

$$(2) \lim_{x \rightarrow 0} x \ln x$$

$$(3) \lim_{x \rightarrow 0} \frac{3x + 5}{2x + 1}$$

$$(4) \lim_{x \rightarrow 0} \sin x \ln x$$

$$(5) \lim_{x \rightarrow 0} \frac{\sin x}{x}$$

$$(6) \lim_{x \rightarrow 0} \frac{1 - \cos x}{x}$$