

## IN CLASS REVIEW

Concepts:

- U-substitution 5.5
- Inverse functions 7.1
- Natural logarithm 7.2\*
- Natural exponential 7.3\*
- General logarithm and exponential 7.4\*
- Inverse trigonometric functions 7.5
- L'Hospital's Rule 7.7
- Integration by Parts 8.1

Example Problems:

1. Consider the function  $t(x) = 7\sqrt{3x - 15}$ .

- (a) Find  $t^{-1}(x)$
- (b) What is the domain of  $t^{-1}$ ?
- (c) What is the range of  $t^{-1}$ ?

2. Find the equation of the tangent line to the curve  $g(x) = e^{2x} \cos(\pi x)$  at the point  $(0, 1)$ .

3. Calculate the limit

$$\lim_{x \rightarrow 0} \frac{e^{4x} - 1 - 4x}{x^2}.$$

4. Evaluate the integrals:

(a)

$$\int (2x + 3)e^x dx$$

(b)

$$\int \frac{e^{-x}}{1 + e^{-2x}} dx$$

(c)

$$\int 2^{\tan \theta} \sec^2 \theta d\theta$$

5. Find the exact value of the expression:

$$\cos\left(2 \tan^{-1}\left(\frac{\sqrt{3}}{3}\right)\right)$$

6. Find the absolute minimum of the expression:

$$g(x) = 3^x - x$$