

Logs and Exponents review Key

May 1, 2013

1. Solve for x

(a) $3^x = 27$

$$x = 3$$

(b) $4^{\ln x} = 1$

$$x = 1$$

(c) $\ln(x^2) = 2 \ln(3)$

$$x = \pm 3$$

(d) $\text{Log}_2(4^x) = 6$

$$x = 3$$

(e) $\text{Log}_3(x) + \text{Log}_3(x + 1) = \text{Log}_3(2) + 1$

$$x = 2$$

(f) $\int_2^x \frac{2u \, du}{u^2 + 1} = 0$

$$x = \pm 2$$

2. Evaluate

(a) $\text{Log}_2(16)$

$$4$$

(b) $\frac{d}{dx} \ln(\sin x)$

$$\cot x$$

$$(c) \int \tan x dx$$

$$\ln(\cos x) + C$$

$$(d) \frac{d}{dx} 5^{3x^2}$$

$$5^{3x^2} \ln(5) 6x$$

$$(e) \int_{-1}^1 (3x^2 - 1)e^{x^3-x} dx$$

$$0$$

$$(f) \frac{d}{dx} \int_1^{e^x+1} (\ln(t-1) + 4) dt$$

$$(x+4)e^x$$