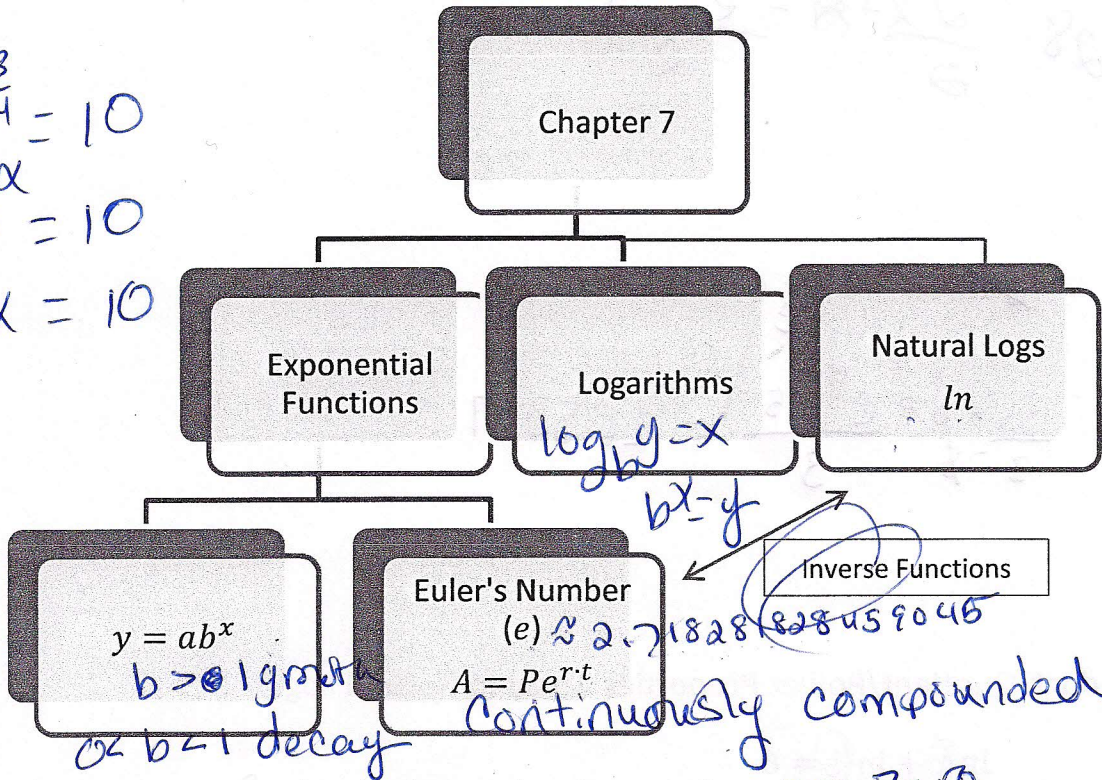


7.6 Natural Logarithms (ln) Notes

$2 \alpha^{\frac{3}{4}} = 10$
 $2 \cdot 4 = 10$
 $\log \alpha = 10$



*Remember you cannot take the \log or \ln of a negative. or zero

Examples ~ Solve for x . Round to 4 decimal places.

1. $5e^{3x} = 18$

≈ 1.4270

~~$\ln 3x = \ln \frac{18}{5}$~~
 $\frac{3x}{3} = \frac{\ln \frac{18}{5}}{3}$

2. $e^x + 1 = 5$

≈ 1.3863

~~$\ln x = \ln 4$~~
 $x = \ln 4$

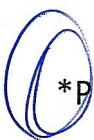
3. $\ln(2x + 4) = 3$

≈ 8.0428

$$\frac{2x+4}{2} = \frac{e^3 - 4}{2}$$

4. $\ln(3x + 5) = 4$

$$\frac{3x+5}{3} = \frac{e^4 - 5}{3} \approx 16.5327$$



*Product/Quotient/Power Properties Apply to Natural Logs.

5. $\ln(x) + \ln(4) = 6$

$$\ln(4x) = 6$$

$$\frac{4x}{4} = \frac{e^6}{4} \approx 100.8572$$

6. $\ln 8 - \ln(x) = \ln 2$

$$\ln \frac{8}{x} = \ln 2$$

$$\frac{8}{x} = 2$$

$$\frac{2x}{2} = \frac{8}{2}$$

$$x = 4$$

Practice: p. 481 #20-38 even, 42-51. Use the information below for # 38.

Space A spacecraft can attain a stable orbit 300 km above Earth if it reaches a velocity of 7.7 km/s.