

PETE 324
Homework no. 1
January 21, 2005

(Due Wednesday, January 26)

(10 points)

1. (a) Integrate the following expression and evaluate it for $a = 4, b = 13.2$

1.1939 $\int_a^b \frac{1}{x} dx \Rightarrow \ln(x) \Big|_a^b = \ln(b) - \ln(a)$

(10 points)

- (b) Integrate the following expression and evaluate it for $a = 1.2, b = 39.7$

6.326×10^{59} $\int_a^b e^{3.5x} dx \Rightarrow \frac{1}{3.5} \exp(3.5x) \Big|_a^b$

(20 points)

2. Assume the equation form $\Delta p = m t + \Delta p_i$. Make a linear plot and evaluate m and

Δp_i given the data: $\Delta p_i = 2300$ at 10 hours; $\Delta p_i = 1700$ at 19 hours. m , Slope = -66.67 psi/hr

Δp_i , Intercept = 2966.7 psi

3. Assume the equation form $\Delta p = m \log t + b$. Make a linear plot and evaluate m and b

given the data: $\Delta p_i = 2300$ at 10 hours; $\Delta p_i = 1700$ at 19 hours. m , Slope = $-2152.4 \text{ psi/cycle}$

b , Intercept = 4452.9 psi

(20 points)

4. Assume the equation form $q = q_{oi} e^{-D_i t}$. Make a linear plot and evaluate q_{oi} and

D_i given the data: $q = 1,200$ at 10 days; $q = 1700$ at 24 days.

$D_i = -0.024884 \text{ cycles/day}$

$q_{oi} = 935.69 \text{ bbl/day}$

5. Assume the equation form $\Delta p = \alpha t^\beta$. Make a linear plot and evaluate α and β given

the data: $\Delta p_i = 800$ at 20 hours; $\Delta p_i = 1700$ at 100 hours.

(20 points)

β , slope = $0.4683 \frac{\text{cycle}}{\text{cycle}}$

α , Intercept = 196068 psi