Assignment 28

al8453na1108

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1

(a)

$$\begin{aligned}
&\int_0^1 \frac{t^2}{16}\,dt \\
&= \frac{t^3}{48}\Big|_0^1 \\
&= \frac{1}{48}
\end{aligned}$$

(b)

$$\begin{aligned}
&1 - \int_0^2 \frac{t^2}{16}\,dt \\
&= 1 - \frac{t^3}{48}\Big|_0^2 \\
&= 1 - \frac{8}{48} \\
&= \frac{5}{6}
\end{aligned}$$

(c)

$$\begin{aligned}
&\int_1^3 \frac{t^2}{16}\,dt \\
&= \frac{t^3}{48}\Big|_1^3 \\
&= \frac{27}{48} - \frac{1}{48} \\
&= \frac{26}{48}
\end{aligned}$$

2

$$\frac{e^{\frac{-2}{5}} - e^{\frac{-3}{5}}}{e^{\frac{-2}{5}}}$$
$$= 1 - e^{\frac{-1}{5}}$$
$$= .1813$$

3

(a)

$$\sum_{k=1}^{\infty} \frac{c}{3^k} = 1$$
$$c * \sum_{k=1}^{\infty} \frac{1}{3^k} = 1$$
$$c * \frac{1}{2} = 1$$
$$c = 2$$

(b)

$$P(2,4,6) = P(2) + P(4) + P(6)$$
$$= 2(\frac{1}{9} + \frac{1}{81} + \frac{1}{729})$$
$$= \frac{182}{729}$$

(c)

$$P(3,4,5,...) = 1 - P(1) - P(2)$$
$$= 1 - \frac{2}{3} - \frac{2}{9}$$
$$= \frac{1}{9}$$