

36. Solution: B

To determine k , note that

$$1 = \int_0^1 k(1-y)^4 dy = -\frac{k}{5}(1-y)^5 \Big|_0^1 = \frac{k}{5}$$

$$k = 5$$

We next need to find $P[V > 10,000] = P[100,000 Y > 10,000] = P[Y > 0.1]$

$$= \int_{0.1}^1 5(1-y)^4 dy = -(1-y)^5 \Big|_{0.1}^1 = (0.9)^5 = 0.59 \text{ and } P[V > 40,000]$$

$$= P[100,000 Y > 40,000] = P[Y > 0.4] = \int_{0.4}^1 5(1-y)^4 dy = -(1-y)^5 \Big|_{0.4}^1 = (0.6)^5 = 0.078 .$$

It now follows that $P[V > 40,000 \mid V > 10,000]$

$$= \frac{P[V > 40,000 \cap V > 10,000]}{P[V > 10,000]} = \frac{P[V > 40,000]}{P[V > 10,000]} = \frac{0.078}{0.590} = 0.132 .$$