Question #162
Key: B

$E\left[x-d \mid x>d\right]$ is the expected payment per payment with an ordinary deductible of *d*
It can be evaluated (for Pareto) as

$$\frac{E(x)-E(x\wedge d)}{1-F(d)}=\frac{\frac{\theta}{\alpha-1}-\frac{\theta}{\alpha-1}\left[1-\left(\frac{\theta}{d+\theta}\right)^{\alpha-1}\right]}{1-\left[1-\left(\frac{\theta}{d+\theta}\right)^{\alpha}\right]}$$

$$=\frac{\frac{\theta}{\alpha-1}\left(\frac{\theta}{d+\theta}\right)^{\alpha-1}}{\left(\frac{\theta}{d+\theta}\right)^{\alpha}}$$

$$=\frac{d+\theta}{\alpha-1}$$

$=d+\theta$ in this problem, since $\alpha=2$

$$E\left[x-100 \mid x>100\right]=\tfrac{5}{3}E\left[x-50 \mid x>50\right]$$

$$100+\theta=\tfrac{5}{3}(50+\theta)$$

$$300+3\theta=250+5\theta$$

$$=\theta=25$$

$$E\left[x-150 \mid x>150\right]=150+\theta$$

$$=150+25$$

$$=175$$