The time, $T$, that a manufacturing system is out of operation has cumulative distribution function

$$F(t) = \begin{cases} 
1 - \left(\frac{2}{t}\right)^2 & \text{for } t > 2 \\
0 & \text{otherwise.}
\end{cases}$$

The resulting cost to the company is $Y = T^2$.

Determine the density function of $Y$, for $y > 4$.

(A) $\frac{4}{y^2}$

(B) $\frac{8}{y^{3/2}}$

(C) $\frac{8}{y^2}$

(D) $\frac{16}{y}$

(E) $\frac{1024}{y^3}$