

Let X and Y be random variables whose probability density function is uniform inside a circle centered at the origin and of radius 12. What is the probability that X and Y both lie in the interval $[0, 2]$?

- (a) $\frac{1}{36\pi}$
- (b) $\frac{1}{6\pi}$
- (c) $\frac{\pi}{6}$
- (d) $\frac{\pi}{36}$
- (e) $\frac{1}{36}$
- (f) $\frac{1}{144}$
- (g) $\frac{1}{6}$
- (h) $\frac{1}{12}$
- (i) $\frac{1}{2}$
- (j) 1
- (k) 0
- (l) None of these