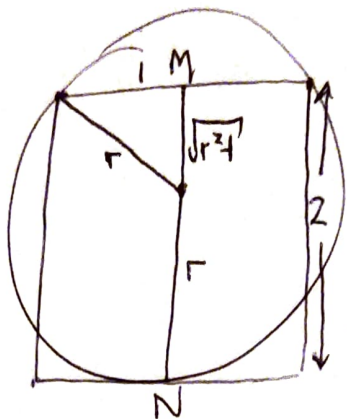


19)



$$MN: r + \sqrt{r^2 - 1} = 2$$

$$\sqrt{r^2 - 1} = 2 - r$$

$$r^2 - 1 = 4 - 4r + r^2$$

$$4r = 5$$

$$r = \frac{5}{4}$$