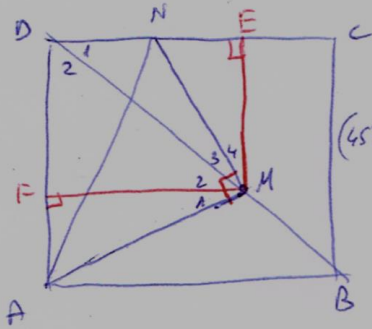


1.66



M N AD DC
 $\angle 1 = \angle 2$
 $(45^\circ - \angle 2 = \angle 3)$ D E M F
 $\angle K M_2 + \angle K M_3 + \angle K M_4 = 90^\circ = \angle K M_1 + \angle K M_2 + \angle K M_3$
 \Downarrow
 $\angle K M_4 = \angle K M_1$
 \Downarrow
 $(S.S) \triangle N M E \sim \triangle A M F$
 \Downarrow
 $N M = A M$

$$S_{AMND} = S_{AMN} + S_{ADN} = \frac{1}{2}x^2 + \frac{1}{2}a \cdot DN = \frac{1}{2}x^2 + \frac{1}{2}a\sqrt{2x^2 - a^2}$$

$$DN = \sqrt{AN^2 - AD^2} = \sqrt{2x^2 - a^2}$$

$$AN = \sqrt{AM^2 + NM^2} = 2\sqrt{x}$$

$\triangle NEM \cong \triangle MFA$

$$S_{DNMA} = S_{DEMF}$$

$$S_{DEMF} = \frac{1}{2} S_{ABCD}$$

$$DE^2 = \frac{1}{2} a^2$$

$$DE = \frac{\sqrt{2}a}{2}$$

$$AF = AD - DF = a - \frac{\sqrt{2}a}{2} = a(1 - \frac{\sqrt{2}}{2})$$

$$AM^2 = AF^2 + FM^2$$

$$x^2 = a^2(1 - \frac{\sqrt{2}}{2})^2 + (\frac{\sqrt{2}a}{2})^2 = a^2(1 - \sqrt{2} + \frac{1}{2}) + \frac{1}{2}a^2 = a^2(2 - \sqrt{2})$$

$$x = a\sqrt{2 - \sqrt{2}}$$