

2020

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ABC

A, B, C

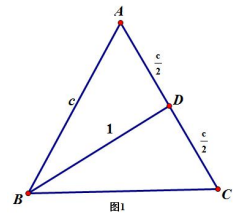
a, b, c .

$c \cos B + b \cos(A + B) = 0$. $BD \perp AC$

$BD = 1$, ABC

_____.

2.



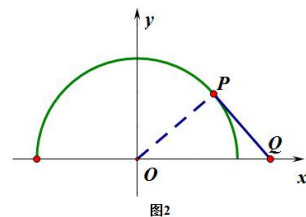
$$S = -\frac{1}{2} \frac{0 - \sin A}{\frac{5}{4} - \cos A} = \frac{0 - \sin A}{\frac{5}{4} - \cos A}$$

$$P(\cos A, \sin A) \quad Q\left(\frac{5}{4}, 0\right)$$

$$P(\cos A, \sin A) \quad x \quad 2.$$

$$S \quad \frac{-\sin A}{\frac{5}{4} - \cos A} \quad PQ$$

$$k_{PQ} = -\frac{4}{3} \quad S = \frac{2}{3}.$$



$$S = \frac{2 \sin A}{5 - 4 \cos A} \quad S' = \frac{10 \cos A - 8}{(5 - 4 \cos A)^2} \quad \cos A = \frac{4}{5} \quad S = \frac{2}{3}.$$

$$\cos A = \frac{\frac{5}{4}c^2 - 1}{c^2}, \quad A,$$

$$S = \frac{1}{2} \sqrt{-\frac{9}{16}c^4 + \frac{5}{2}c^2 - 1}$$

$$t = c^2 \quad S^2 = \frac{1}{4} \left(-\frac{9}{16}t^2 + \frac{5}{2}t - 1 \right) \quad t = \frac{20}{9} \quad c = \frac{2\sqrt{5}}{3} \quad S^2 = \frac{4}{9}$$

$$S_{\triangle ABC} = \frac{2}{3}.$$

3.2

$$BE = 1 - x \quad m^2 - x^2 = 4m^2 - (1 - x)^2 \quad AE \quad AE = h \quad AD = m \quad DE = x \quad AB = 2m$$

$$m^2 = \frac{1 - 2x}{3} \quad h^2 = m^2 - x^2 = -x^2 - \frac{2}{3}x + 1$$

$$S_{\triangle ABD} = \frac{1}{2}h = \frac{1}{2} \sqrt{-x^2 - \frac{2}{3}x + 1} \quad \frac{1}{3} \quad x = -\frac{1}{3} \quad S_{\triangle ABC}$$

$$\frac{2}{3}.$$

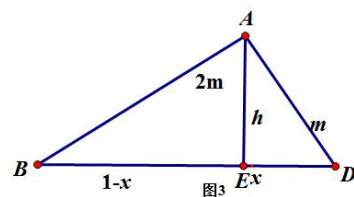


图3

$$AC^2 + BD^2 = 2(BA^2 + BC^2)$$

$$4 + 4m^2 = 8m^2 + 8n^2 \quad m^2 = 1 - 2n^2 \quad ABCD \quad AB = 2m \quad BC = 2n \quad AM \perp BC \quad M \quad AM = h$$

$$S_{\triangle ABC}^2 = n^2 h^2 = n^2 (4m^2 - n^2) = n^2 (4 - 9n^2)$$

$$= \frac{1}{9} (9n^2 (4 - 9n^2)) = \frac{1}{9} \left(\frac{9n^2 + 4 - 9n^2}{2} \right) = \frac{4}{9}$$

$$n^2 = \frac{2}{9} \quad S_{\triangle ABC} = \frac{2}{3}.$$

$$n \quad h$$

$$n \quad h$$

$$5 \quad R \text{ 在 } BND \quad 9n^2 + h^2 = 4 \quad 6nh$$

$$S_{\triangle ABC} = nh = \frac{2}{3}.$$

$$h = 3n = \sqrt{2} \quad S_{\triangle ABC} = \frac{2}{3}.$$

$$6 \quad BC \quad AM \quad BD \quad O \quad OB = OC$$

$$\frac{AB}{AD} = \frac{BO}{OD} = 2 \quad OB = \frac{2}{3}$$

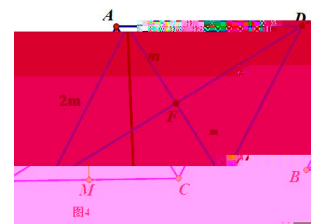


图4

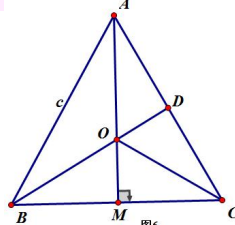
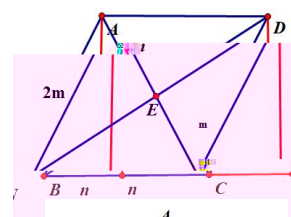


图6

