

(3) (C)

$$a^2 = \varepsilon^2 + \varepsilon(1+\sqrt{2})^2 - 2 \times \varepsilon \times \varepsilon(1+\sqrt{2}) \cos 45^\circ$$

$$a^2 = 14 - \varepsilon + \varepsilon(1+\sqrt{2})^2 - 2\varepsilon - 2\varepsilon\sqrt{2} = 12$$

$$\Rightarrow a = 2\sqrt{3}$$

(-)

$$\frac{2\sqrt{3}}{\sin 45^\circ} = \frac{\varepsilon}{\sin B} \Rightarrow \sin B = \frac{\sqrt{2}}{2}$$

$$\Rightarrow B = 45^\circ$$

$$\Rightarrow C = 90^\circ$$

نصف كس 1/2

(1)

$$\hat{A} = 110^\circ - 40^\circ = 70^\circ$$

$$\frac{BC}{\sin A} = \frac{AC}{\sin B}$$

$$\frac{40}{\frac{\sqrt{2}}{2}} = \frac{r \cdot \frac{14}{r}}{\sin B}$$

$$\Rightarrow \sin B = \frac{\sqrt{2}}{2}$$

$$\Rightarrow B = 45^\circ$$

$$C = 180^\circ - 45^\circ = 135^\circ$$

(4)

$$r^2 = 1^2 + r^2 - 2 \times 1 \times r \times \cos \alpha$$

$$\Rightarrow \cos \alpha = \frac{1}{\varepsilon}$$

$$DE^2 = 1^2 + 4^2 - 2 \times 1 \times 4 \times \frac{1}{\varepsilon} = 20$$

$$\Rightarrow DE = \sqrt{20} = 2\sqrt{5}$$

المثلث ADC

$$\frac{AC}{\sin 40^\circ} = \frac{r\sqrt{2}}{\frac{\sqrt{2}}{2}}$$

$$\Rightarrow AC = r\sqrt{2}$$

$$m = \sin 40^\circ \times AC$$

$$= \frac{\sqrt{2}}{2} \times r\sqrt{2} = m$$

(3) (✓)

$$BC^2 = a^2 + 1^2 - 2 \times a \times 1 \times \cos 40^\circ = 24$$

$$\Rightarrow BC = \sqrt{24}$$

$$\angle ABC = 180^\circ - 110^\circ - 40^\circ = 30^\circ$$

(12)

$$\frac{b^2 - r^2}{\sin B} = \frac{c}{\sin C}$$

$$\Rightarrow b^2 - r^2 = b$$

$$\Rightarrow b^2 - b - r^2 = 0$$

$$\Rightarrow b = \frac{1 \pm \sqrt{1 + 4r^2}}{2}$$

(1)

$$\cos A = \frac{b^2 + c^2 - a^2}{2bc} \Rightarrow b^2 + c^2 - a^2 = 2bc \cdot \cos A$$

$$\frac{b^2 + c^2 + rbc - a^2}{bc(\cos A + 1)} = \frac{rbc(\cos A + 1)}{bc(\cos A + 1)} = r$$

(12)

$$14^2 = r_0^2 + r^2 - 2 \times r_0 \times r \times \cos B$$

$$\Rightarrow \cos B = 0.11$$

$$\Rightarrow \sin B = \sqrt{1 - 0.11^2}$$

$$\Rightarrow \sin B = 0.99$$

