

从直角三角形谈起学习指南参考答案

答案与解析:

一、知识梳理

1. $a^2 + b^2 = c^2$;

2. $\angle A + \angle B = 90^\circ$;

3. $\sin A = \frac{a}{c}$, $\cos A = \frac{b}{c}$, $\tan A = \frac{a}{b}$; $\sin B = \frac{b}{c}$, $\cos B = \frac{a}{c}$, $\tan B = \frac{b}{a}$.

4. $\sin^2 A + \cos^2 A = 1$, $\tan A = \frac{\sin A}{\cos A}$; $\sin A = \cos B$ 或 $\sin B = \cos A$.

$$\sin 30^\circ = \frac{1}{2}, \cos 30^\circ = \frac{\sqrt{3}}{2}, \tan 30^\circ = \frac{\sqrt{3}}{3};$$

5. $\sin 45^\circ = \frac{\sqrt{2}}{2}$, $\cos 45^\circ = \frac{\sqrt{2}}{2}$, $\tan 45^\circ = 1$;

$$\sin 60^\circ = \frac{\sqrt{3}}{2}, \cos 60^\circ = \frac{1}{2}, \tan 60^\circ = \sqrt{3};$$

二、基础训练

1 【解析】

在 $\text{Rt}\triangle ABC$ 中, $\angle ACB = 90^\circ$, D 是边 AB 的中点,

$$\therefore CD = \frac{1}{2}AB.$$

$$\because CD = 5, \therefore AB = 10.$$

$$\because \sin \angle ABC = \frac{AC}{AB} = \frac{3}{5},$$

$$\therefore AC = 6.$$

$$\therefore BC = \sqrt{AB^2 - AC^2} = \sqrt{10^2 - 6^2} = 8.$$

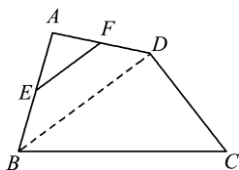
2 【解析】: (1) 连接 AC . $\because \angle B = 90^\circ$, $\therefore AC^2 = BA^2 + BC^2 = 4 + 4 = 8$.

$$\because DA^2 + CD^2 = (\sqrt{7})^2 + 1^2 = 8, \therefore AC^2 = DA^2 + CD^2,$$

$\therefore \triangle ADC$ 是直角三角形, 即 $\angle D$ 是直角.

三、能力提升

3 【解析】: 如图所示,



连结 BD . 由三角形中位线定理, 得 $BD = 2EF = 2 \times 2 = 4$.

又 $\because BC = 5$, $CD = 3$, $\therefore CD^2 + BD^2 = BC^2$, $\therefore \triangle BDC$ 是直角三角形且 $\angle BDC = 90^\circ$,

$$\therefore \tan C = \frac{BD}{CD} = \frac{4}{3}. \text{ 故选 B.}$$

解析： 四边形 $ABCD$ 是矩形， $\therefore AB = CD, \angle D = 90^\circ$,

矩形 $ABCD$ 沿 CE 折叠后点 B 落在边 AD 的点 F 处，

4 【解析】

$$\therefore CF = BC, \therefore \frac{AB}{BC} = \frac{2}{3}, \therefore \frac{CD}{CF} = \frac{2}{3}, \text{ 设 } CD = 2x, XF = 3x (x > 0)$$

$$\therefore DF = \sqrt{CF^2 - CD^2} = \sqrt{5}x, \therefore \tan \angle DCF = \frac{DF}{CD} = \frac{\sqrt{5}x}{2x} = \frac{\sqrt{5}}{2}$$