MPM2D Name: _____

Quiz – Similar Triangles & Tangent Ratio

/K 16

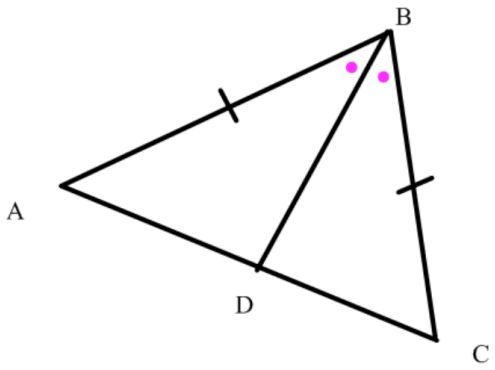
Marks

1. Are $\triangle ABD$ and $\triangle CBD$ only similar? Or, are they congruent as well?

Show your work formally, being certain to state shortforms for angle theorems.

For each statement, provide justification.

K 3



statement	justification
$\angle ABD = \angle CBD$	(given)
$\angle DAB = \angle DCB$	(ITT ... isosceles $\triangle$ theorem)
$\angle ADB = \angle CDB$	(SATT)
$AB = BC$	(given)
$BD = BD$	(shared side, must be same length)

If all angles are equal, and two pairs of corresponding sides are equal, then $AD = DC$.

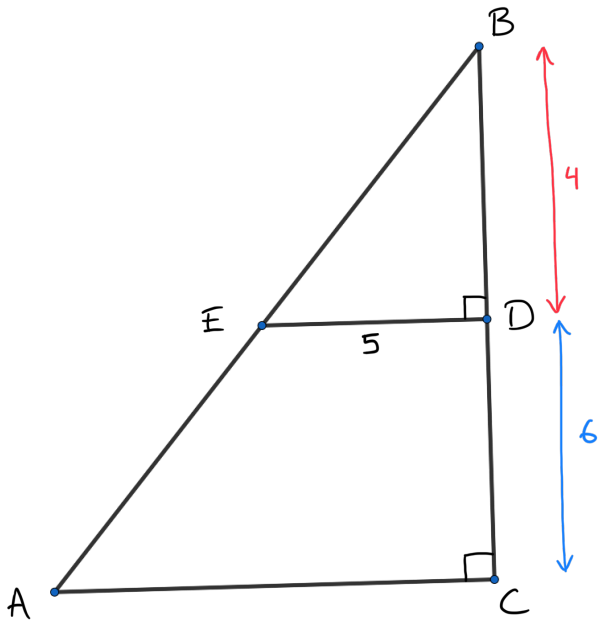
$\therefore \triangle ABD \cong \triangle CBD$ (congruent to)

2. What is the length of AC?

Show your work formally, being certain to state shortforms for angle theorems.

For each statement, provide justification.

K 4



statement	justification
$\angle D = \angle C$	(given)
$\angle ABC = \angle EBD$	(same angle)
$\angle A = \angle E$	(SATT)

$\therefore \triangle ABC \sim \triangle EBD$

Then:

$$\frac{AC}{ED} = \frac{BC}{BD}$$

$$\frac{x}{5} = \frac{10}{4}$$

$$20\left[\frac{x}{5}\right] = \left[\frac{10}{4}\right]20$$

$$4x = 50$$

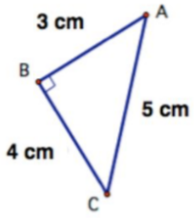
$$\frac{4x}{4} = \frac{50}{4}$$

$$x = 12.5$$

Marks

3. Given the triangle below, state the indicated ratios.

K 2

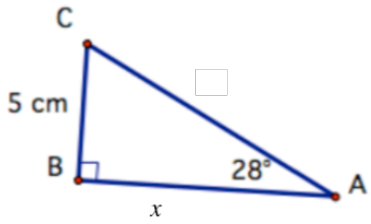


$\tan A = \frac{4}{3}$

$\tan C = \frac{3}{4}$

4. Find the length of x, accurate to the nearest tenth of a centimetre.

K 3



$\tan 28° = \frac{5}{x}$

$x[\tan 28°] = \left[\frac{5}{x}\right]x$

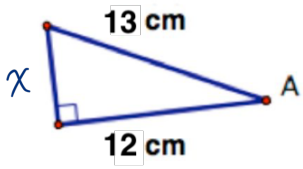
$x(\tan 28°) = 5$

$\frac{x(\tan 28°)}{\tan 28°} = \frac{5}{\tan 28°}$

$x \doteq 9.4$

5. Find the measure of $\angle A$ to the nearest whole degree.

K 4



Let x be the length of the third side.

$13^2 = x^2 + 12^2$

$-12^2 \quad -12^2$

$13^2 - 12^2 = x^2$

$169 - 144 = x^2$

$25 = x^2$

$\sqrt{25} = \sqrt{x^2}$

$5 = x$

$\tan A = \frac{5}{12}$

$\angle A = \tan^{-1}\left(\frac{5}{12}\right)$

$\angle A \doteq 23°$