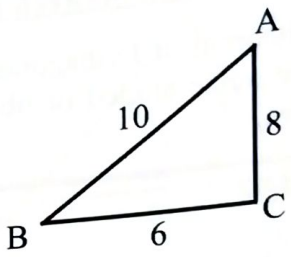
Example 6

In ΔABC, AB = 10 units, BC = 6 units and AC = 8 units.
Show that ΔABC is right-angled and state which angle is the right-angle.



Solution

Square all of the sides:

$BC^2 = (6)^2 = 36$

$AC^2 = (8)^2 = 64$

$AB^2 = (10)^2 = 100$

Now find out which two squares add up to the third square. Clearly 100 is the sum of 36 and 64.

$\therefore AB^2 = BC^2 + AC^2$

$\therefore \Delta ABC$ is a right-angled triangle and the right-angle is at C.

EXERCISE 2

(a) In the triangles below, show that the triangle is right-angled and state which angle is the right-angle.

(1) In ΔABC, AB = 24, BC = 7 and AC = 25.

(2) In ΔABC, $c = 14$, $b = 48$ and $a = 50$.

(3) In ΔPQR, PQ = 24 m, QR = 70 m and PR = 74 m.

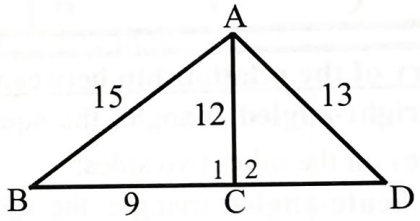
(4) In ΔPQR, $p = 80$ cm, $q = 82$ cm and $r = 18$ cm.

(b) In ΔABC, AB = 15, BC = 9 and AC = 12
and in ΔACD, AC = 12 and AD = 13.

(1) Show that ΔABC is right-angled at $\hat{C}_1$.

(2) Why is $\hat{C}_2 = 90°$?

(3) Calculate the length of CD.



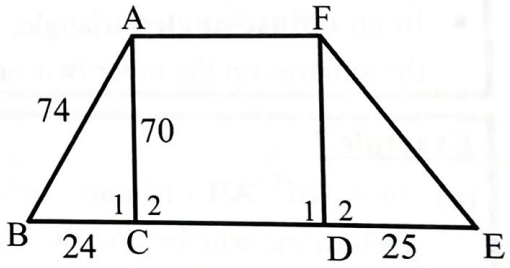
(c) In ΔABC, AB = 74, BC = 24, AC = 70 and DE = 25.

(1) Show that ΔABC is right-angled at $\hat{C}_1$.

(2) If ACDF is a square, why is ΔFDE a right-angled triangle?

(3) Calculate the length of EF rounded off to two decimal places.

(4) Calculate the perimeter of trapezium ABEF.



(d) ABCD and EBFD are parallelograms. AE = ED.

(1) Show that ABCD is a rectangle.

(2) Why is $\hat{C} = 90°$?

(3) Calculate the length of FC.

(4) Calculate the perimeter of ABCD.

(5) Calculate the area of ABCD.