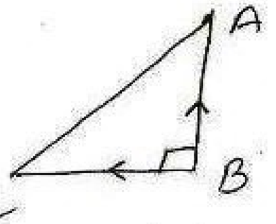
Ex 6.5

(11)



$AB = s \times t$
$= 1000 \times \frac{3}{2}$
$= 1500\,km$

$BC = s \times t$
$= 1200 \times \frac{3}{2}$
$= 1800\,km$

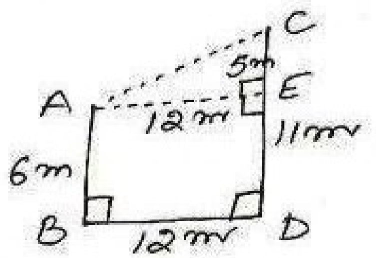
In rt $\triangle CBA$

$AC^2 = AB^2 + BC^2$ (Pyth. th.)
$= 1500^2 + 1800^2$
$= 2250000 + 3240000$
$= 5490000$

$AC = \sqrt{5490000}$
$= 100\sqrt{549}$
$= 100 \times 3\sqrt{61}$
$= 300\sqrt{61}$

$\therefore$ reqd. distance $= 300\sqrt{61}\,km$

(12)



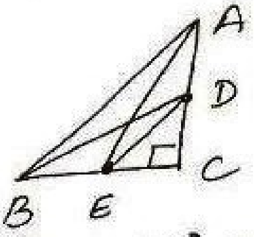
$CE = CD - ED$
$= 11 - 6$
$= 5m$

In rt $\triangle AEC$

$AC^2 = AE^2 + EC^2$ (Pyth. th.)
$= 12^2 + 5^2$
$= 144 + 25$
$AC = \sqrt{169}$
$= 13$

$\therefore$ reqd dis $= 13m$

(13)



To Prove $AE^2 + BD^2 = AB^2 + DE^2$

Proof – In rt $\triangle ACE$

$AE^2 = AC^2 + EC^2$ (Py. th.) ---(i)

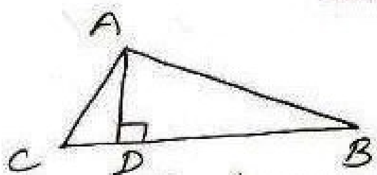
In rt $\triangle BCD$

$BD^2 = BC^2 + CD^2$ (Py. th.) ---(ii)

(i) + (ii)

$AE^2 + BD^2 = (AC^2 + BC^2) + (EC^2 + CD^2)$
$= AB^2 + ED^2$ [using Py. theorem in $\triangle ACB, \triangle DCE$]

(14)



given – In fig $DB = 3CD$

To Prove $2AB^2 = 2AC^2 + BC^2$

Proof – In rt $\triangle ADB$

$AB^2 = AD^2 + DB^2$ (Py th.)
$= AD^2 + (3CD)^2$
$= AD^2 + 9CD^2$
$= AD^2 + CD^2 + 8CD^2$
$AB^2 = AC^2 + 8 \times \left(\frac{BC}{4}\right)^2$

[(iii) $BC = CD + BD$
$= CD + 3CD$
$= 4CD$
$CD = \frac{BC}{4}$
(iv) $AD^2 + CD^2 = AC^2$ (Py th.)]

$AB^2 = AC^2 + \cancel{8} \times \frac{BC^2}{\cancel{16}\,2}$

(×2) $2AB^2 = 2AC^2 + BC^2$