CBSE Grade 7 Triangle and its Properties

Q1) Is it possible to have a triangle with following property. If yes, then draw. If No, then give reason.

i) With two obtuse angles?

ii) With two Altitudes?

iii) With altitude outside the triangle?

iv) With measure of sides as 2.2cm, 3.6cm, and 6cm?

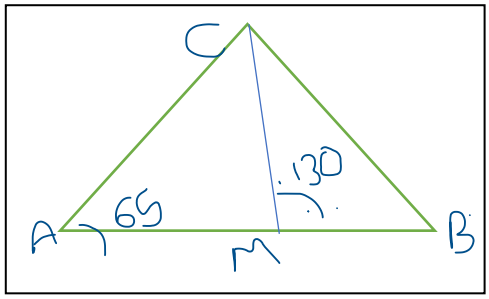
v) With two right angles?

Q2) The square of the hypotenuse of an isosceles right-angled triangle is $242cm^2$. What is the length of each equal side?

Q3) One of the exterior angle of a triangle is 110° and the interior opposite angles are in the ratio 4:7. Find the angles of the triangle.

Q4) A ship leaves a port and travels 12km due east. Then it turns and travels 9km due north. How far is the ship from the port?

Q5) The diagram shows a simple device in which AMB is a straight rod and CM is a rod pivoted at M with AM = BM = CM. Find $\angle ACB \; if \; \angle CAM = 65^\circ \; and \; \angle BMC = 130^\circ$.



Q6) Two poles 15m and 30m high stand upright in a playground. If their feet are 36 meters apart, find the distance between their tops.

Q7) ABCD is a quadrilateral. Is AB + BC + CD + DA > AC + BD?

Answer Key

Sol 1)

i) No, sum of angles will exceed 180°.

ii)Yes, Any Right-angled triangle.

iii)Yes, Any Obtuse Triangle.

iv) No, 2.2 + 3.6 < 6

v) No, sum of angles will exceed 180°.

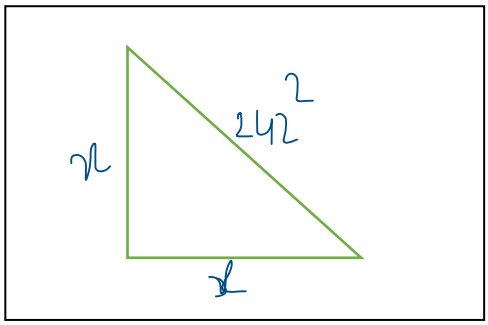
Sol 2) Given, $x^2 + x^2 = 242$

$2x^2 = 242$

$x^2 = \frac{242}{2}$

$x^2 = 121$

$x = \sqrt{121} = 11$



Sol 3) $4x + 7x = 110$

($\because$ Measure of exterior angle is equal to sum of two interior opposite angles.)

$11x = 110 \implies x = 10 \therefore angles\ are\ 40^{\circ}\ and\ 70^{\circ}$

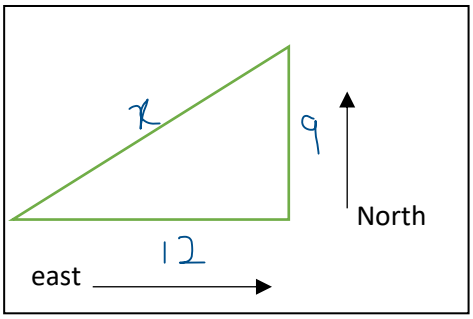
Sol 4)

$12^2 + 9^2 = x^2$

$144 + 81 = x^2$

$169 = x^2$

$x = 13$ Ship is 13km far from the port.



Sol 5) $\angle CAM = 65^{\circ}\ \ and\ \angle BMC = 130^{\circ}$

$\angle BMC = \angle CAM + \angle ACM$

$130 = 65 + \angle ACM \therefore \angle ACM = 65^{\circ}$--------1

In isosceles $\Delta CMB, \angle MCB = \angle CBM$

$\angle AMC = \angle MCB + \angle CBM \implies 2\angle MCB = 50 \implies \angle MCB = 25 = \angle CBM$

$\therefore \ \angle ACB = 65 + 25 = 130^{\circ}$

Sol6)

AB and CD are two poles then,

AB=30m CD=15m

Draw line CP //BD

AP = 15 $\because AB = 30, PB = CD = 15$

By pythagores theorem

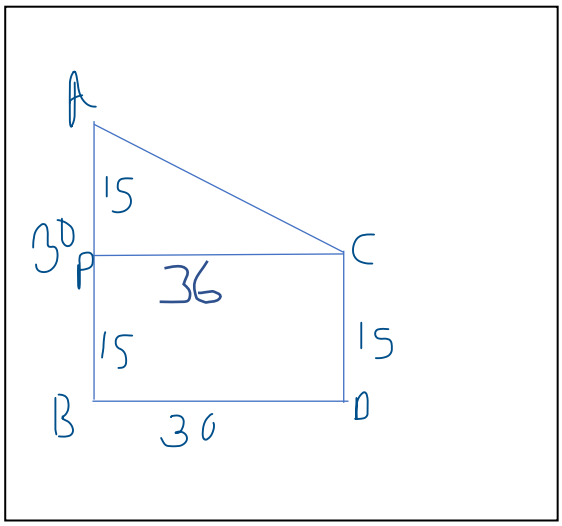
$AP^2 + PC^2 = AC^2$

$15^2 + 36^2 = AC^2$

$225 + 1296 = AC^2$

$1521 = AC^2$

$39 = AC$



Sol 7)

Sol)

In Tr ADC and Tr ABC

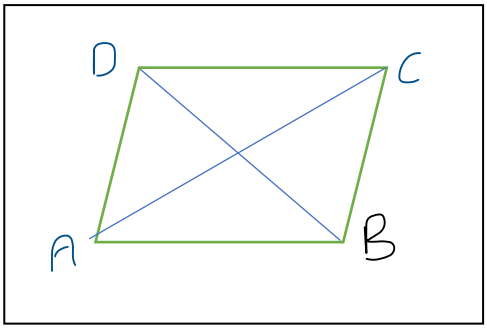
AD + CD >AC -------3rd property -------1

AB + BC > AC-------3rd property -------2

In Tr DCB and Tr DAB

CD + BC > BD-------3rd property -------3

AB + AD > BD-------3rd property -------4



1 + 2+ 3+ 4

AD + CD +AB +BC + CD +BC +AB +AD > AC +AC +BD +BD

2AB + 2BC + 2CD + 2AD >2AC + 2 BD

2(AB + BC + CD + AD) > 2(AC+ BD)