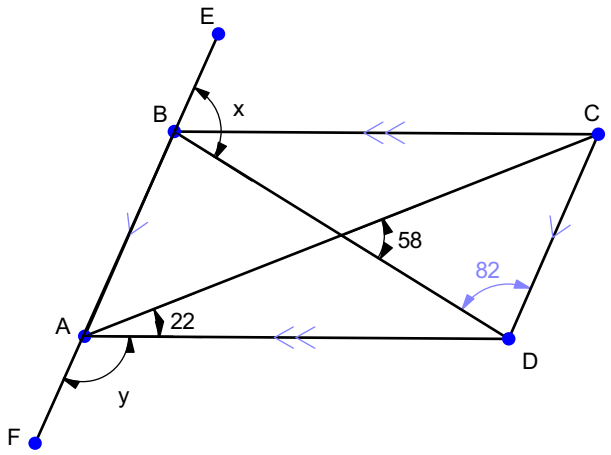
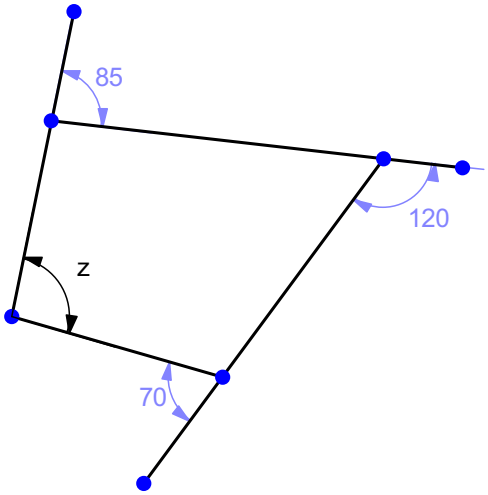
Geometry Exercise

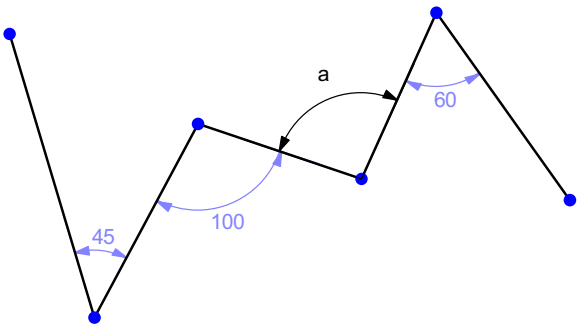
(1) Find x and y



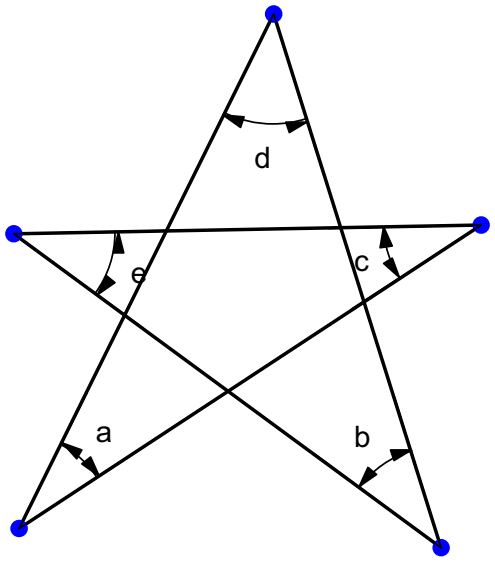
(2) Find z



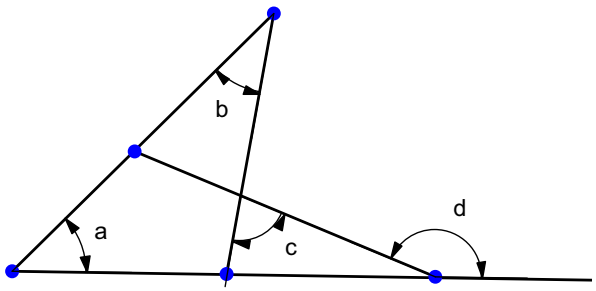
(3) Find a



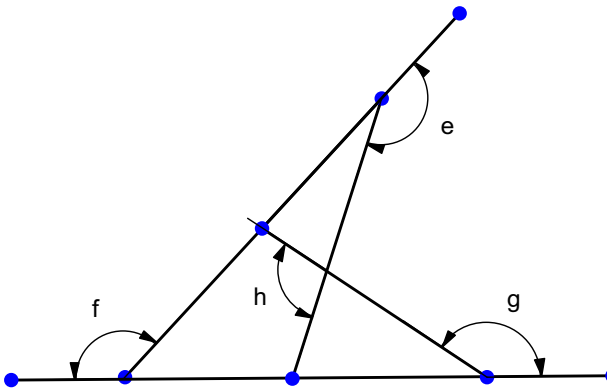
(4) Find a + b + c + d + e



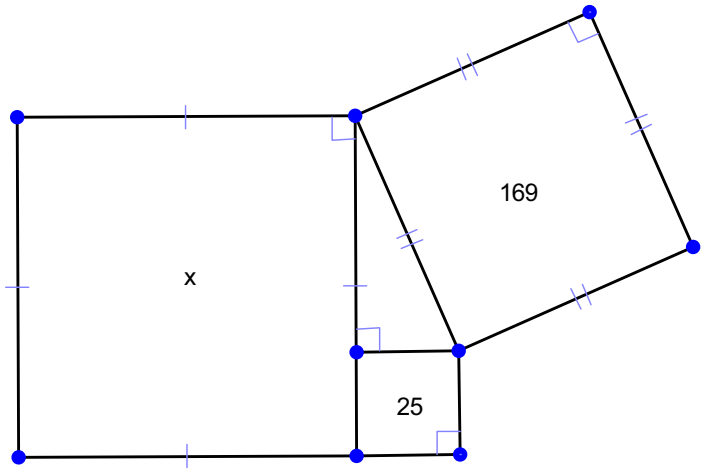
(5) Express d in terms of a, b, c



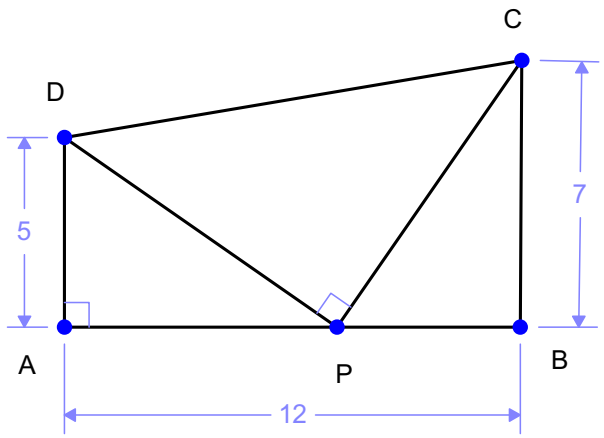
(6) Find e + f + g + h



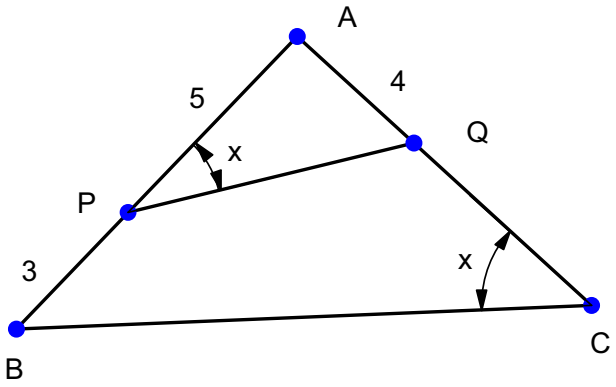
7. In quadrilateral ABCD, $\angle A = x+10^\circ, \angle B = x+20^\circ, \angle C = x+50^\circ, \angle D = x+60^\circ$. Find x and prove that ABCD is a trapezium.
8. ABCDE is a regular pentagon. AC cuts BE at H. Find $\angle BHC$
9. Each interior angle of a regular polygon is 144° . Find the number of sides of the polygon
10. In triangle ABC, $\angle A = 48^\circ$. The bisectors of $\angle B$ and $\angle C$ cut at I. Find $\angle BIC$.
11. In triangle ABC, $\angle B = 55^\circ$, $\angle C = 75^\circ$. The perpendiculars from B, C to AC, AB cut at H. Find $\angle BHC$
12. In triagnle ABC, $\angle A = 103^\circ$, $\angle B = 32^\circ$. AD is the perpendicular from A to BC. Prove that AD = DC.
13. In triangle ABC, the bisector of $\angle BAC$ cuts BC at P and the bisector of $\angle ACB$ meets AB at Q. If $\angle APB = 78^\circ$, $\angle BQC = 82^\circ$, find $\angle ABC, \angle ACB$
14. ABP is an equilateral triangle outside the square ABCD. Find (a) $\angle DPC$ (b) $\angle ACP$
15. ABQ is an equilateral triangle inside the square ABCD. Find $\angle AQC$
16. The figure shows 3 squares with areas 25, 169 and x. Find x



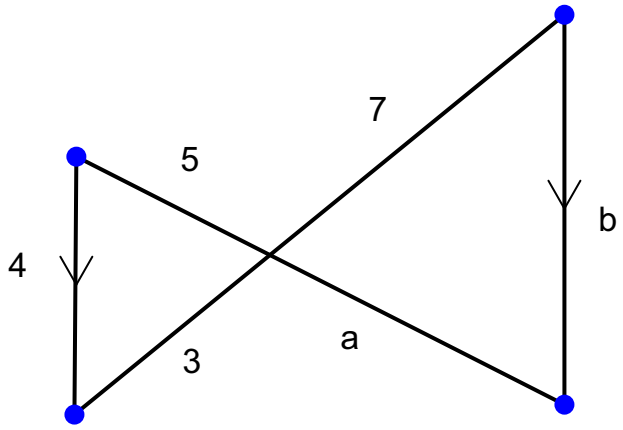
17. In the figure, find AP (2 answers)



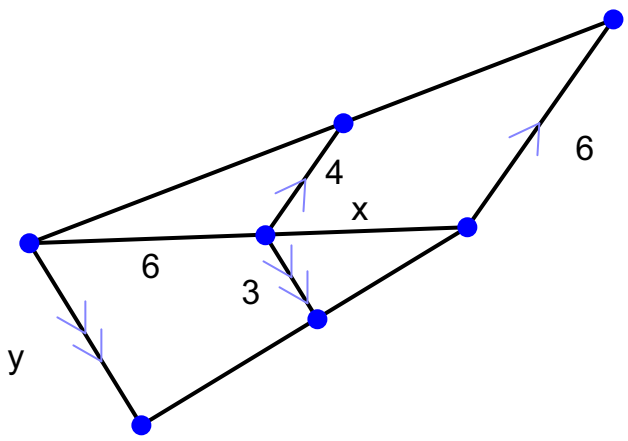
18. In ΔABC , $\angle ACB = 90^\circ$ and AC=2 CB. CL is an altitude from C to AB. Prove that AL = 4 LB.
19. In the figure, find QC.



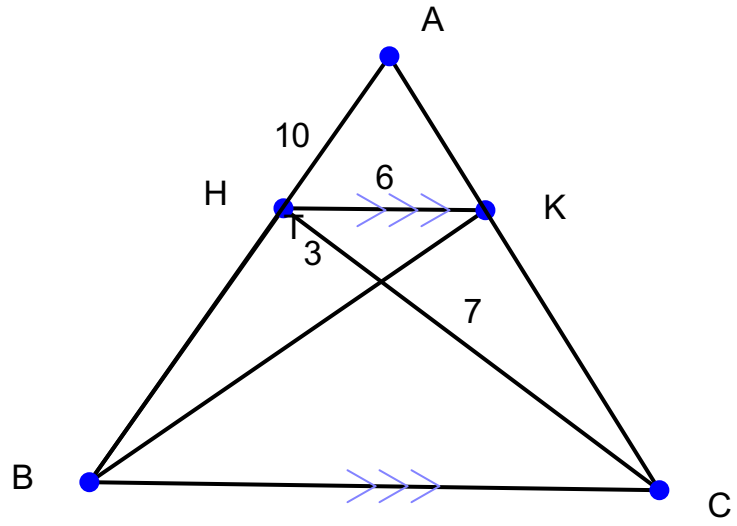
20. In the figure, find a, b.



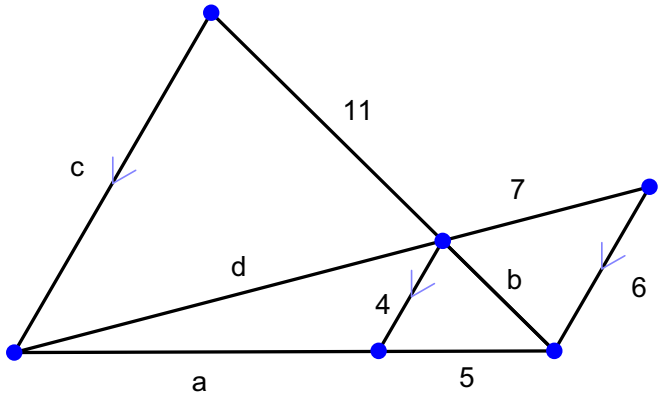
21. In the figure, find x and y.



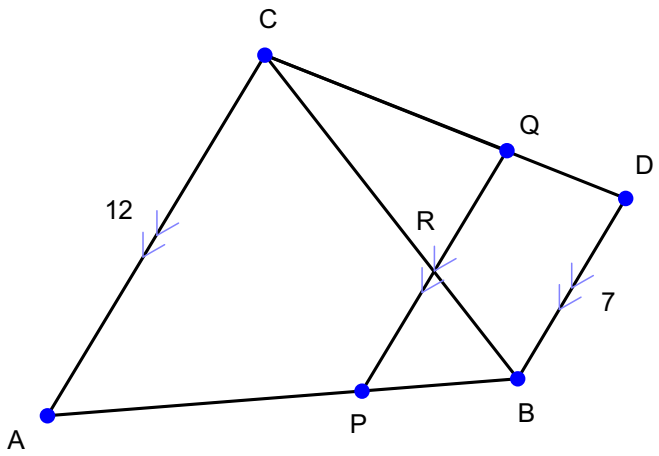
22. In the figure, HK || BC. Find BC and HB.



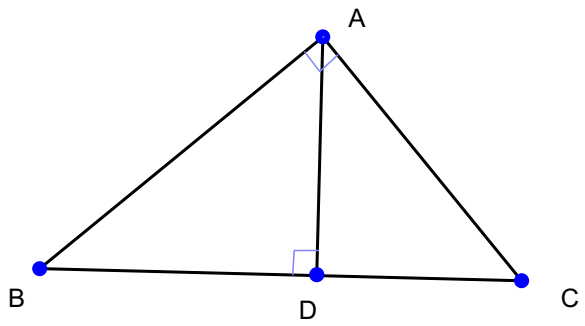
23. In the figure, find a, b, c, d



24. In the figure, AP : PB = 2 : 1. Find PQ.

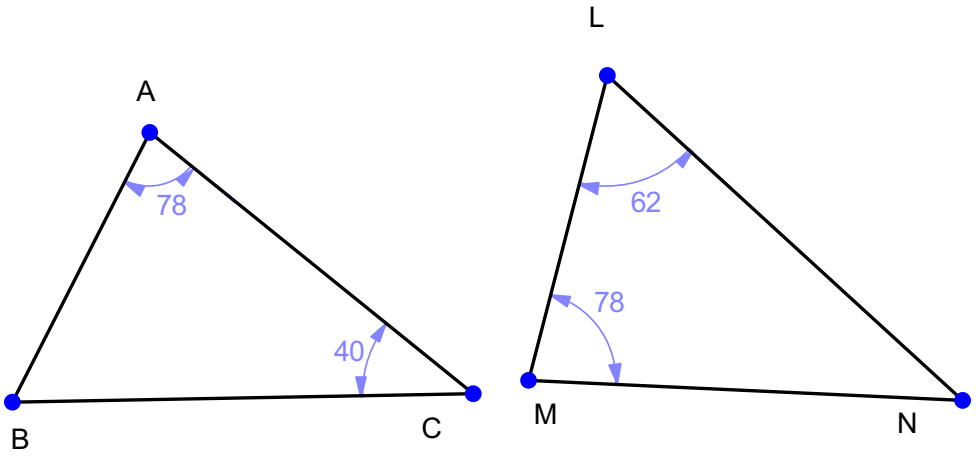


25. In the figure, explain why there are 3 triangles similar to one another. If AC = 5, AD = 4, find AB



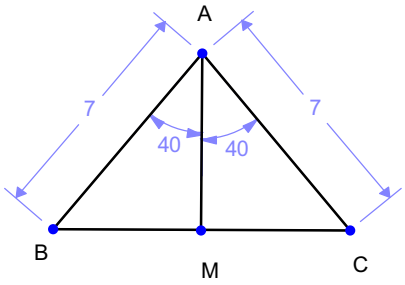
26. Decide whether triangles ABC and XYZ are necessarily congruent and if so, give reasons:
    26.1 AB = XY, BC = YZ, $\angle C = \angle Z$
    26.2 AB = XY, $\angle A = \angle X, \angle B = \angle Z$
    26.3 AB = XY, BC = XZ, $\angle B = \angle X$
    26.4 AC = YZ, $\angle B = \angle Y, \angle C = \angle Z$
    26.5 BC = YZ, $\angle B = \angle Y, \angle C = \angle Z$

27. Are the 2 triangles in the figure congruent? Why?



State the reasons why the following figures contain congruent triangles. Name the congruent triangles.

28.



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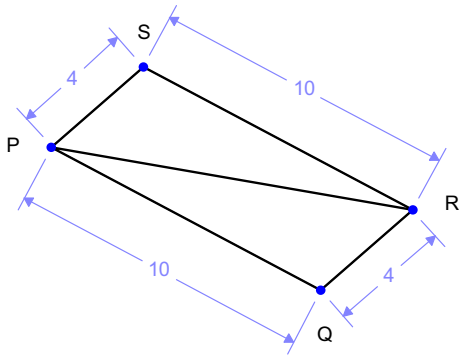

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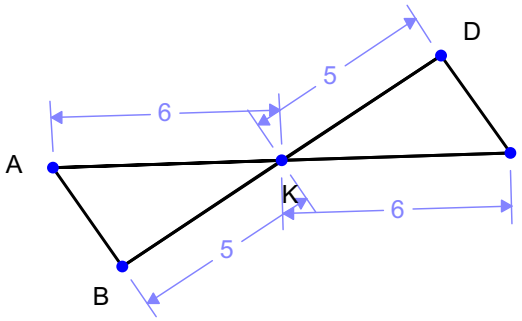

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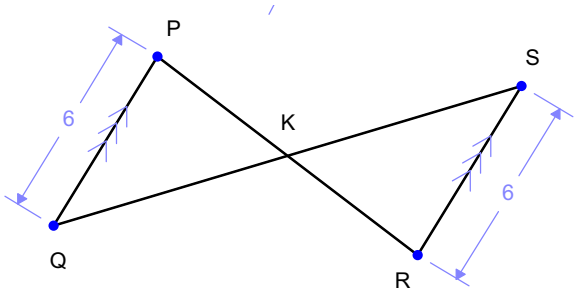

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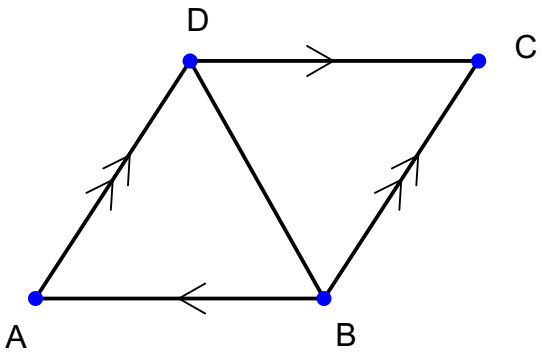

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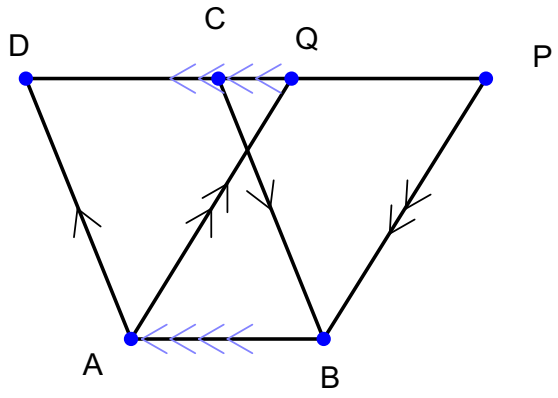

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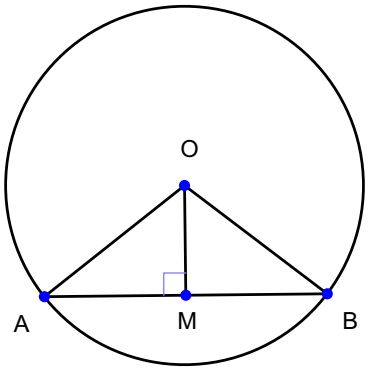
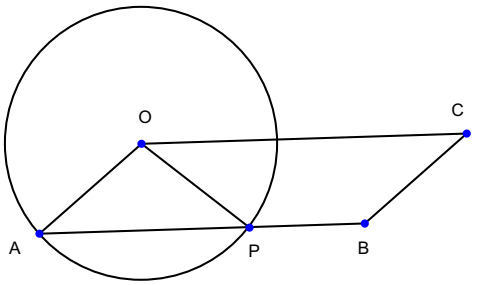
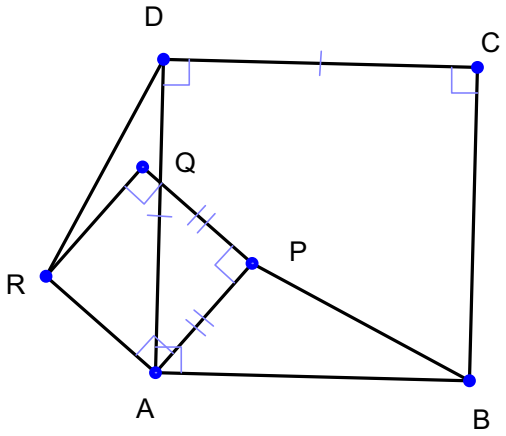


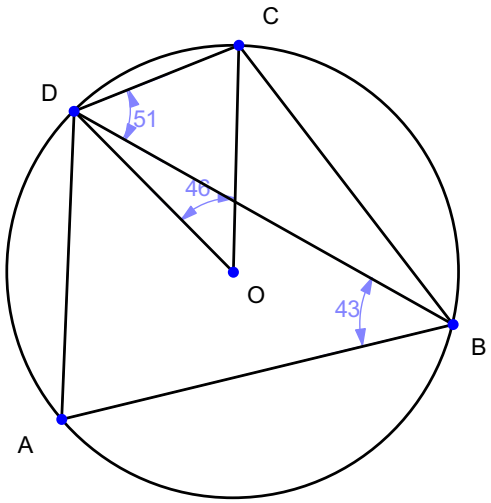
35. State what you know about the parallelogram ABCD (a) if AC bisects $\angle BCD$ (b) if AC = BD, (c) if AC is perpendicular to BD
36. Two equal cicles, centre A, B cut at P, Q. Prove that APBQ is a rhombus.
37. In the figure, O is the centre of the circle and OABC is a parallelogram. Prove that $\angle POC = \angle BCO$



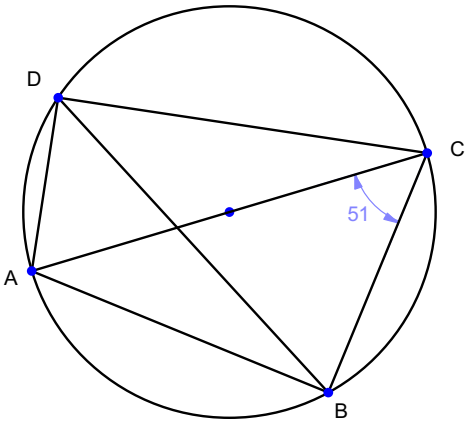
38. In the figure, ABCD and APQR are 2 squares. Prove that triangles BAP, ADR are congruent.



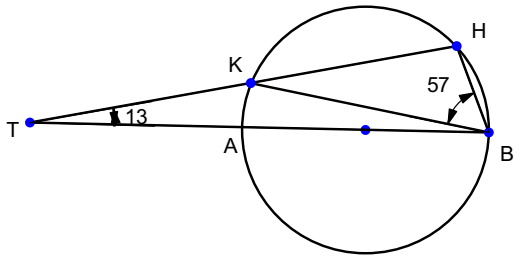
39. In the figure, find $\angle AOB$.



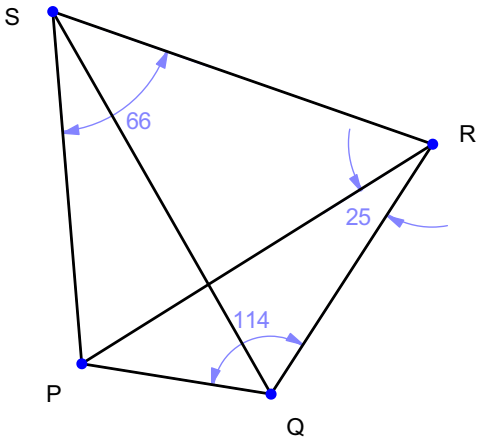
40. In the figure, AC is a diameter. Find $\angle BDC$.



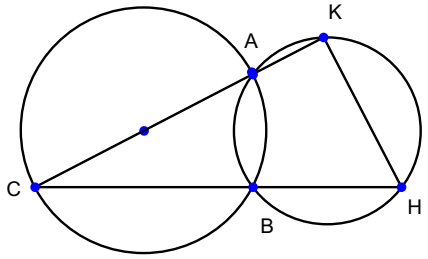
41. In the figure, AB is the diameter. Find $\angle HKB$. (Hint : join AH)



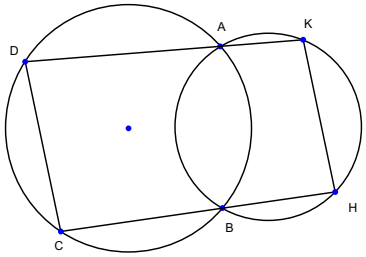
42. In the figure, find $\angle QSR$.



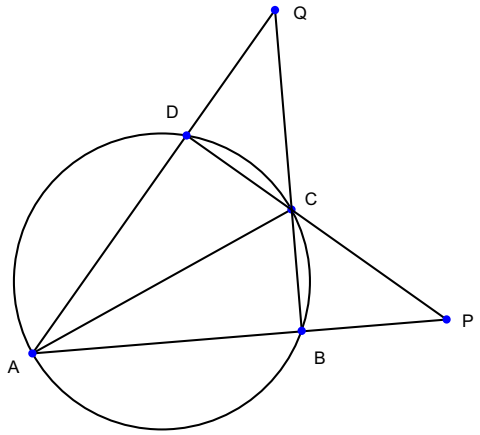
43. In the figure, CAK, CBH are straight lines. CA is a diameter of the circle ABC. Prove $\angle AKH = 90^\circ$.



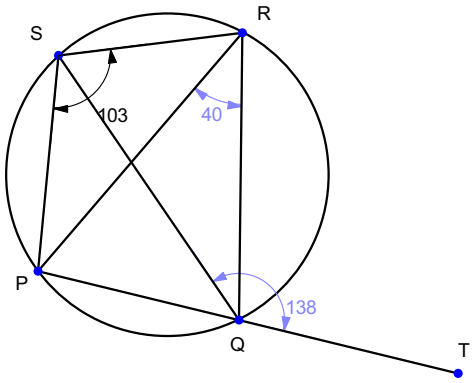
44. In the figure, DAK, CBH are straight lines. Prove CD || HK.



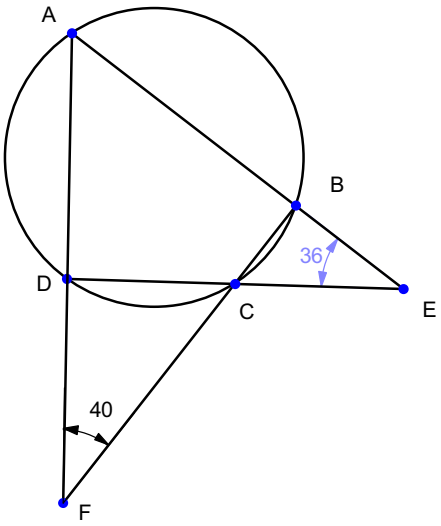
45. In the figure, $\angle APD = \angle AQB$. Prove that AC is a diameter.



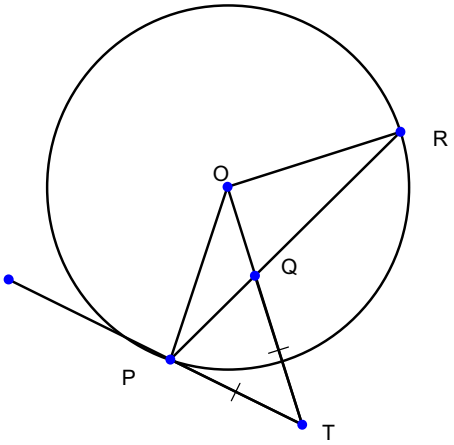
46. Calculate $\angle QPR, \angle RPS$.



47. Find $\angle DAB$.

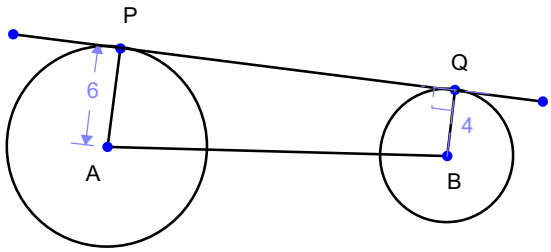


48. In the figure, O is the centre and PT is tangent to the circle. If TP = TQ, prove that $\angle ROT = 90^\circ$. (Hint : join OP).

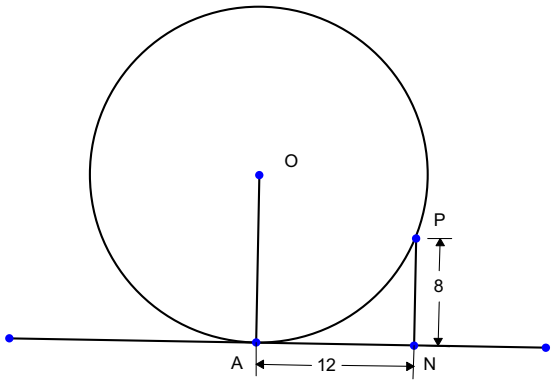


49. AOB is a diameter of a circle with centre O. The tangent at B meets any chord AP at T. Prove $\angle ATB = \angle OPB$

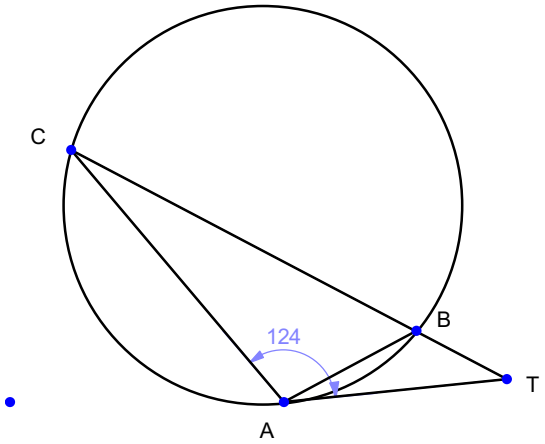
50. In the figure, AP and BQ are radii, and PQ is tangent to both circles. If AP = 6, BQ = 4, AB = 13, calculate PQ.



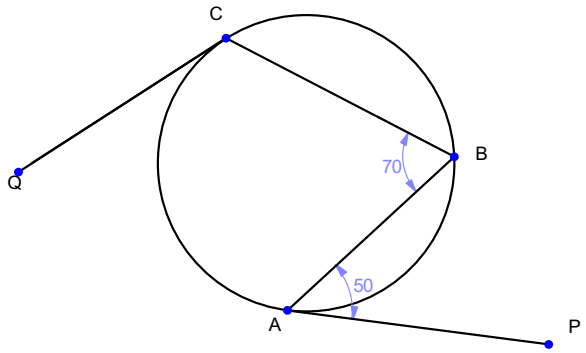
51. In the figure, AN is tangent to the circle, O is the centre. Find the radius r of the circle.



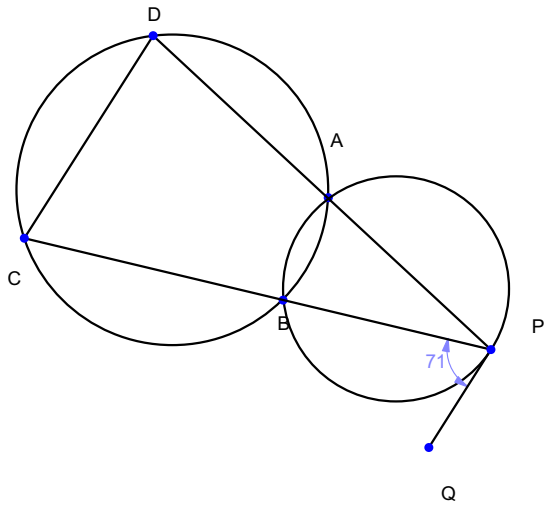
52. In the figure, AT is tangent to the circle. Find $\angle ABC$.



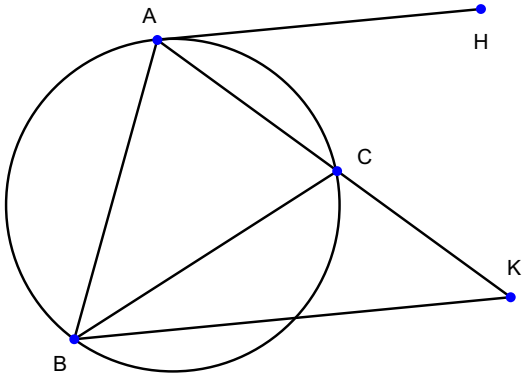
53. In the figure, AP, CQ are tangents. Find $\angle BCQ$.



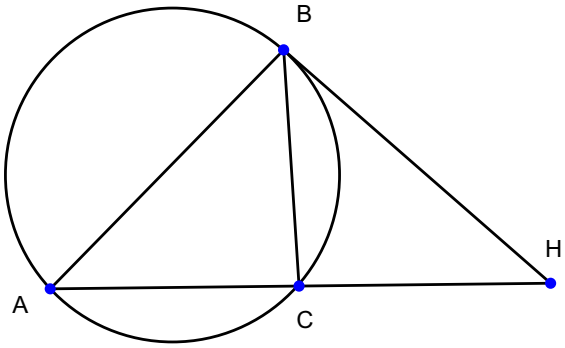
54. In the figure PQ is a tangent. Find $\angle BCD$.



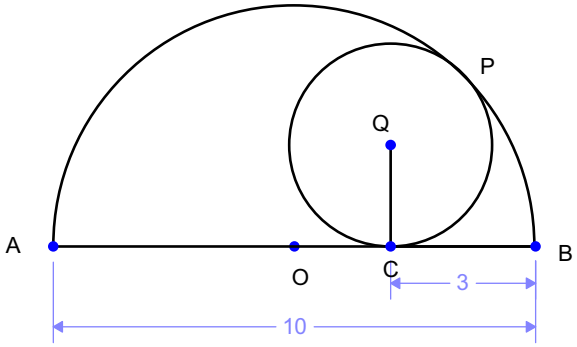
55. In the figure, AH || BK and AH is tangent to the circle. Prove $\angle ABK = \angle ACB$. (Hint : produce HA)



56. In the figure, BH is tangent to the circle, and $\angle ABC = \angle AHB$. Prove AB is a diameter.



57. In the figure, the circle QCP touches the semicircle AOBP at C and P. AB = 10, CB = 3. Find QC.



(1) 98° ; 118° (2) 95° (3) 115° (4) 180° (5) d = a + b + c (6) 540° (7) 55°

(8) 72° (9) 10 (10) 114° (11) 130° (13) $73\frac{1}{3}^\circ$; $49\frac{1}{3}^\circ$ (14) a. 30° b. 30° (15) 135°

(16) 289 (17) 5 ; 7 (19) 6 (20) $11\frac{2}{3}$; $9\frac{1}{3}$ (21) 3 ; 9 (22) 14 ; $\frac{40}{3}$

(23) 10 ; 5.5 ; 12 ; 14 (24) $8\frac{2}{3}$ (25) $6\frac{2}{3}$ (26) a., b. no c. yes ; SAS d. no e. yes;AAS

(27) yes ; AAS (28) $\Delta ABM \equiv \Delta ACM$; SAS (29) $\Delta RPQ \equiv \Delta PRS$; SSS

(30) $\Delta DKC \equiv \Delta BKA$; SAS (31) $\Delta SRK \equiv \Delta QPK$; AAS (32) $\Delta DAB \equiv \Delta BCD$; SSS

(33) $\Delta BCP \equiv \Delta ADQ$; SSS (34) $\Delta OAM \equiv \Delta OBM$; RHS (35) a. rhombus b. rectangle c. rhombus

(39) 126° (40) 39° (41) 23° (42) 41° (46) 63° ; 35° (47) 52° (50) $\sqrt{165}$

(51) 13 (52) 56° (53) 120° (54) 71° (57) 2.1

