Planner

# Constructions

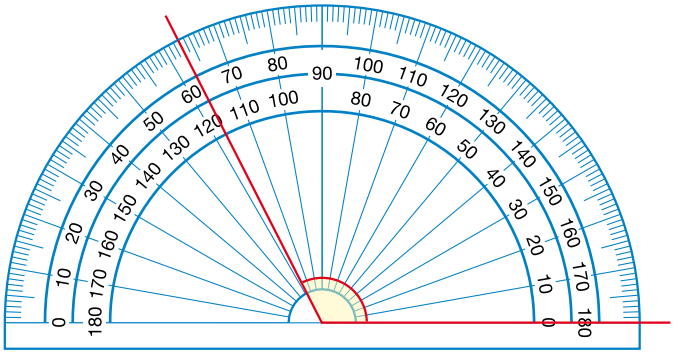
- Measuring and drawing reflex angles
- Constructing a triangle given two sides and the included angle
- Constructing a triangle given two angles and the included side
- Solving problems using constructions

Keywords

You should know

explanation 1

**1** Stephen is measuring an angle between two lines. He uses a 180° protractor. The diagram shows the angle that he is trying to measure.



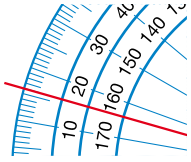
Stephen thinks that the reading could be 123°, 117°, 63° or 77°.

**a** How do you know the angle cannot be either 63° or 77°?

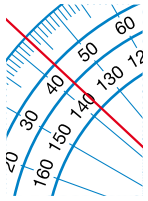
**b** Which is the correct reading, 123° or 117°?

**2** Find the **acute** angles shown on these protractor scales.

**a**

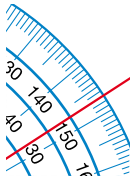


**b**



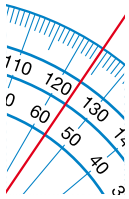
**c**

**d**

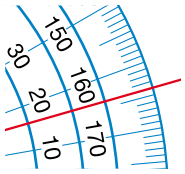


**3** Find the **obtuse** angles shown on these protractor scales.

**a**



**b**



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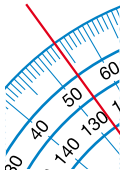
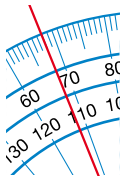


**d**



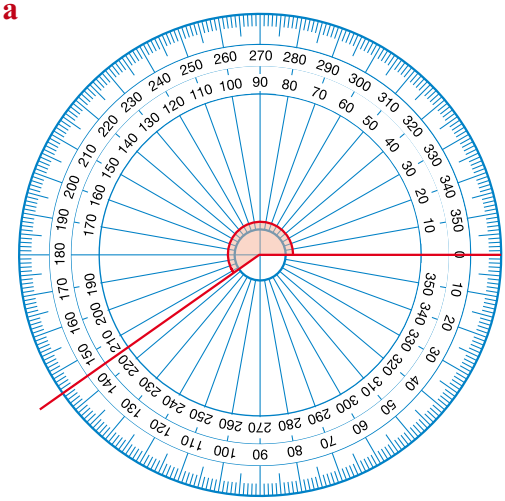
**4** Use a protractor to draw these angles.

| | | | | |
|---|---|---|---|---|
| **a** 60° | **b** 75° | **c** 130° | **d** 155° | **e** 42° |
| **f** 132° | **g** 58° | **h** 163° | **i** 56° | **j** 108° |

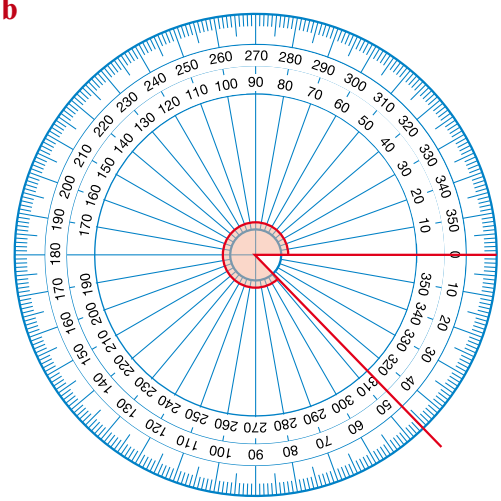
explanation 2 online

**5** These are 360° protractors. Find the angles shown.

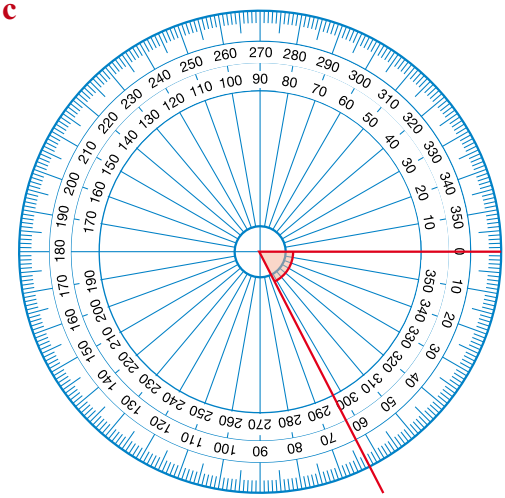
**a**



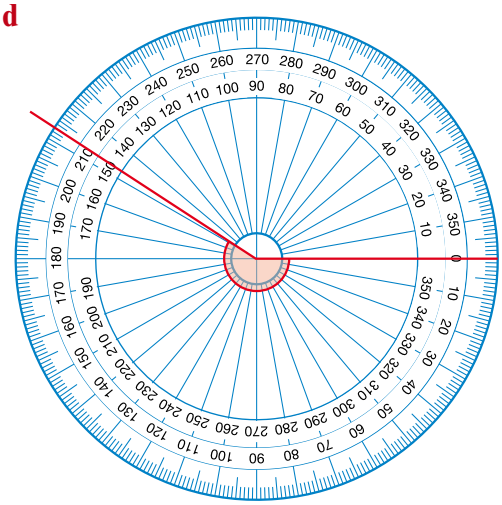
**b**



**c**

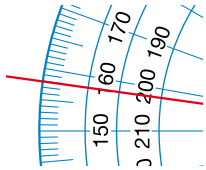


**d**

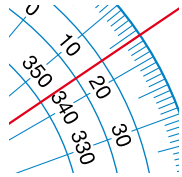


**6** Use the information given on these diagrams to find the unknown *reflex* angles.

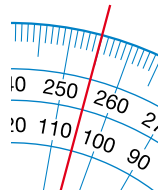
**a**



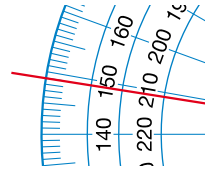

**b**




**c**




**d**

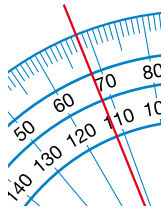



**7** Use a protractor to draw these reflex angles.

**a** 300° **b** 245° **c** 198° **d** 273° **e** 317°

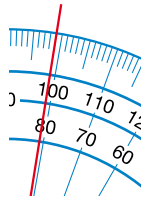
**8** Find the size of each angle. Use the type of angle and the measurement shown on the protractor scales to help you.

**a**



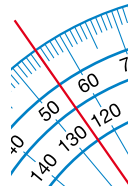

Acute

**b**



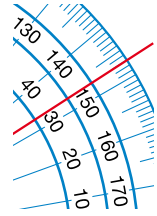

Obtuse

**c**



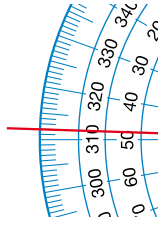

Acute

**d**



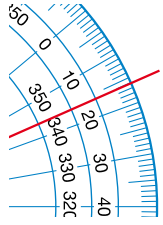

Obtuse

**e**



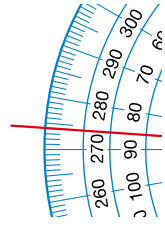

Reflex

**f**



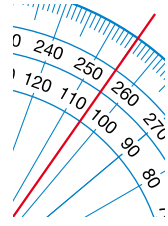

Acute

**g**




Reflex

**h**




Obtuse

**9** Use a protractor to draw these angles.

**a** 45° **b** 30° **c** 120° **d** 75° **e** 145°

**f** 163° **g** 28° **h** 200° **i** 260° **j** 335°

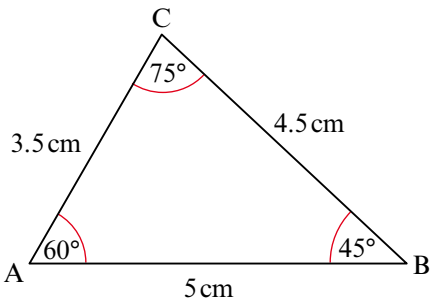
explanation 3

**10** Look at triangle ABC. Write down the size of these sides and angles.

**a** AB **b** AC

**c** CB **d** ∠ABC

**e** ∠CAB **f** ∠BCA



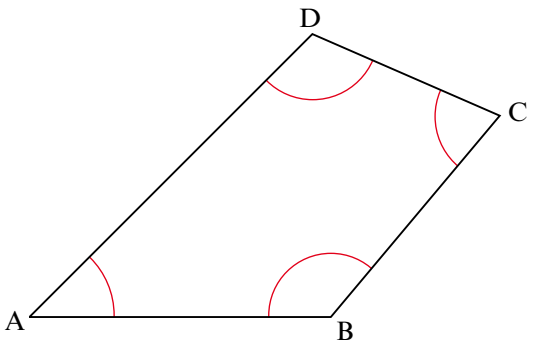

**11** Look at quadrilateral ABCD. Measure the size of these sides and angles.

**a** AB **b** DA

**c** BC **d** CD

**e** ∠ABC **f** ∠BCD

**g** ∠CDA **h** ∠DAB

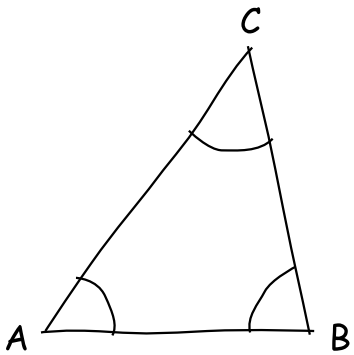



**12** Sketch triangle ABC. Add the measurements to your sketch.

AB = 6 cm ∠ABC = 55°

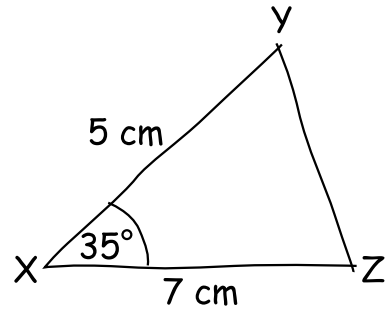
AC = 5 cm ∠ACB = 80°

BC = 4.3 cm ∠BAC = 45°



explanation 4a | explanation 4b | explanation 4c | online

**13** Look at the sketch of triangle XYZ.



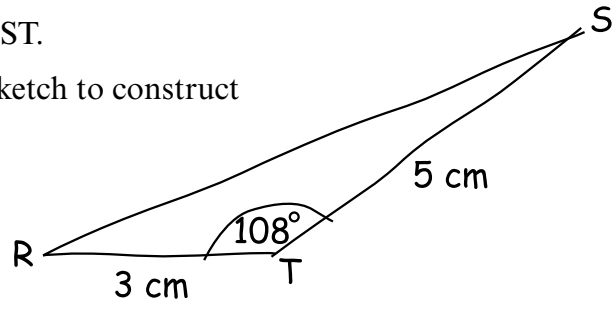

**a** Use the information in this sketch to construct triangle XYZ.

**b** **i** Find the length of YZ.

**ii** Find ∠XZY.

**iii** Find ∠XYZ.

**14** Look at the sketch of triangle RST.



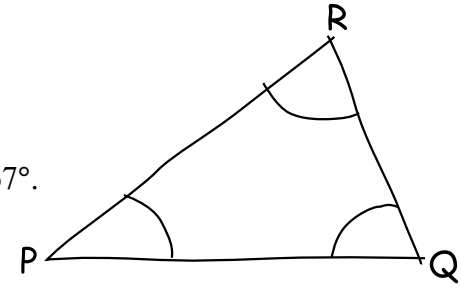

**a** Use the information in this sketch to construct triangle RST.

**b** **i** Find the length of RS.

**ii** Find ∠TRS.

**iii** Find ∠TSR.

**15** Look at the sketch of triangle PQR.




**a** Copy the sketch of triangle PQR.
Add this information to your sketch.

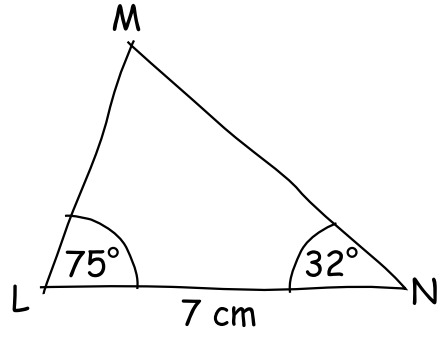
PQ = 8.5 cm, QR = 3.6 cm, ∠PQR = 67°.

**b** Construct triangle PQR.

**c** Measure PR and ∠PRQ.

explanation 5a | explanation 5b | explanation 5c | explanation 5d | online

**16** Look at the sketch of triangle LMN.




**a** Use the information in this sketch to construct triangle LMN.

**b** **i** Find the length of LM.

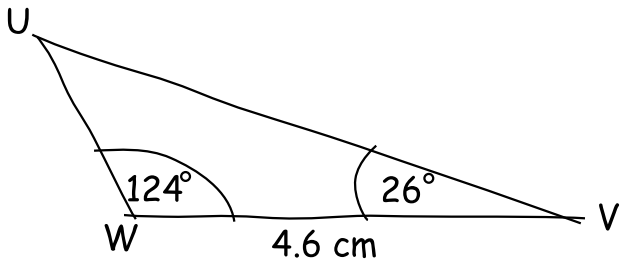
**ii** Find the length of MN.

**17** Look at the sketch of triangle UVW.

**a** Use the information in this sketch to construct triangle UVW.

**b** **i** Find the length of UW.

**ii** Find the length of UV.



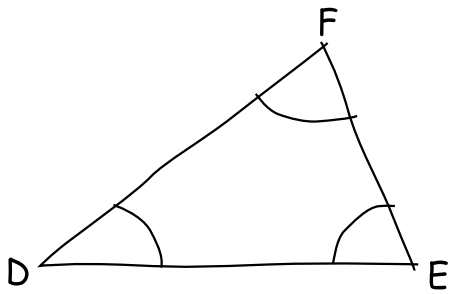

**18** Look at the sketch of triangle DEF.

**a** Copy the sketch of triangle DEF.
Add this information to your sketch.

DE = 7.8 cm, ∠DEF = 68°, ∠FDE = 32°.

**b** Construct triangle DEF.

**c** Measure DF and EF.

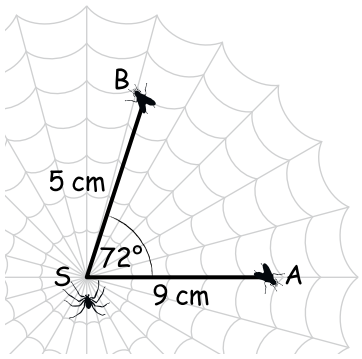



**19** The sketch shows part of a spider's web.
Two flies get caught in the web at A and B.
The spider at S can tell how far away each fly is and what direction it is in.

SA = 9 cm
SB = 5 cm
∠ASB = 72°

**a** Construct the triangle ABS.

**b** Measure the distance between the two flies.




**20** A caterpillar at C and a snail at S are 6 cm apart.
They both see a tasty leaf at L.
The direction of L from C and from S is shown in the sketch.

**a** **i** Calculate ∠CSL. Explain your answer.

**ii** Explain why angle CLS is 42°.

**b** Construct the triangle CSL.

**c** Measure the lengths CL and SL to the nearest millimetre.

***d** The caterpillar moves twice as fast as the snail.
Which one will reach the leaf first?