Textbook Exercise 8.1   *(Enhanced version)*

Section Check

Determine whether each of the following is correct. Put a tick '✓' in the box if it is correct and a cross '✗' if it is not.

☐   **(a)**   A regular polygon must be convex.

☐   **(b)**   If $\angle A = 80°$ and $\angle B = 10°$, then $\angle A$ and $\angle B$ are supplementary angles.

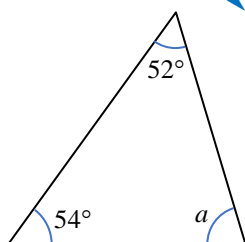☐   **(c)**   In $\triangle PQR$, $\angle P + \angle Q + \angle R = 180°$.

☐   **(d)**   In the figure, $x = 111°$.

Level 1

In each of the following, find the unknown. **(1 – 8)**
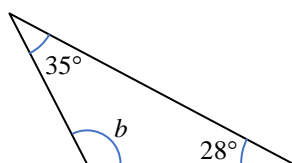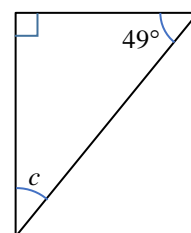
[Original Exercise 8.1 Q1]
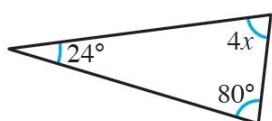**1.**   ◄ Demo 1(a)

[Original Exercise 8.1 Q2]
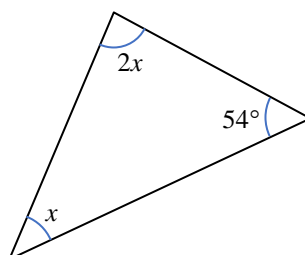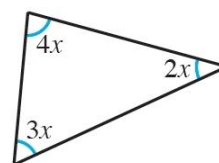**2.**

[Original Exercise 8.1 Q3]
3.

4.
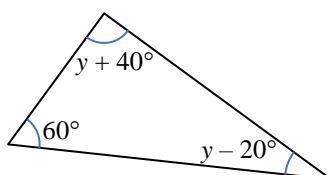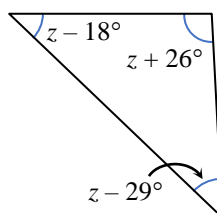
[Original Exercise 8.1 Q4]
5.

6.

▲ Example 8.1

[Original Exercise 8.1 Q5]
7.

[Original Exercise 8.1 Q6]
8.

In each of the following, *ABC* is a straight line. Find the unknown. **(9 – 16)**
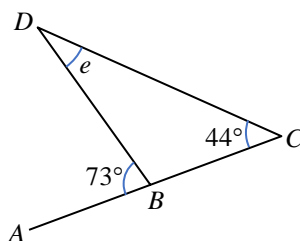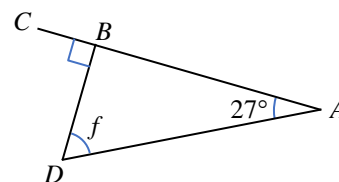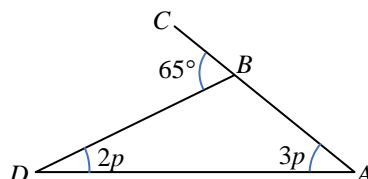
[Original Exercise 8.1 Q7]
9.   ◄ Demo 1(b)

$36°$

$69°$

A

B

C

D

d
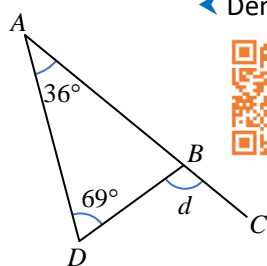
[Original Exercise 8.1 Q8]
10.

D

e

$44°$ *C*

$73°$

B

A

[Original Exercise 8.1 Q9]
11.

C

B

$27°$ *A*

f

D

12.

D

$4x$

A

B

x

C

[Original Exercise 8.1 Q10]
13.

C

$65°$ *B*

$2p$

$3p$

D   *A*

14.

A $37°$

D

$2x$

$3x – 7°$

B

C
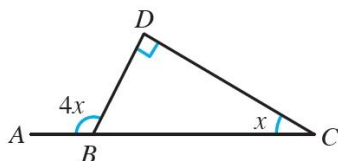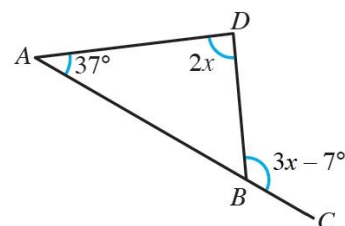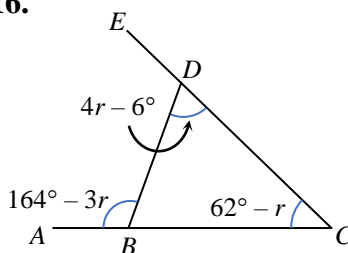
▲ Example 8.2

[Original Exercise 8.1 Q11]
15.

C

$q – 12°$

$q + 16°$

B

D

$q + 45°$

A

[Original Exercise 8.1 Q12]
16.

E

D

$4r – 6°$

$164° – 3r$

$62° – r$

A

B

C

[Original Exercise 8.1 Q13]
17.   It is given that *p* and *q* are complementary angles. If *p* is 4 times of *q*, find *p* and *q*.

[Original Exercise 8.1 Q14]
18.   It is given that *x* and *y* are supplementary angles. If *x* is greater than *y* by 54°, find *x* and *y*.

[Original Exercise 8.1 Q15]
19.   It is given that $\triangle ABC$ is an equilateral triangle. Find $\angle ABC$.

[Original Exercise 8.1 Q16]
20.   In $\triangle PQR$, $\angle P = \angle Q = 50°$. Find $\angle R$.

Level 2

In each of the following, find the unknown(s). **(21 – 23)**

21.

A

$56°$

D

$50°$

B *x*

x

C

ADC is a straight line.

22.   ◄ Example 8.3

B

$32°$

x

$60°$

y

$40°$ *C*

A

D

ADC is a straight line.

23.

A

D

$106°$

C *x*

y

E

$28°$

B
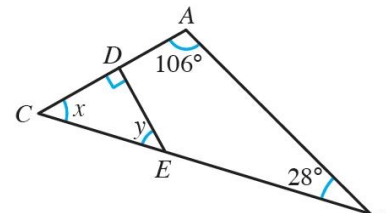
ADC and *CEB* are straight lines.

In each of the following, *ABC* and *BDE* are straight lines. Find the unknown. **(24 – 26)**

[Original Exercise 8.1 Q17]
24.

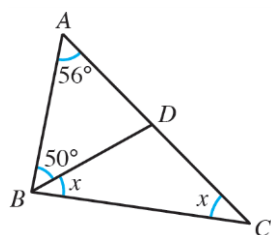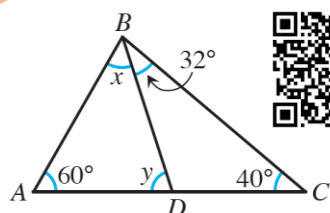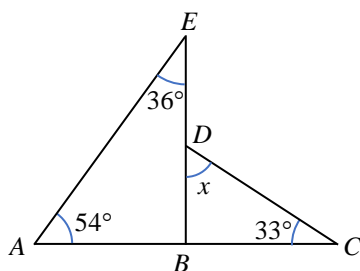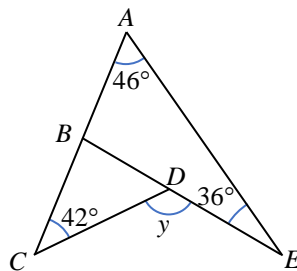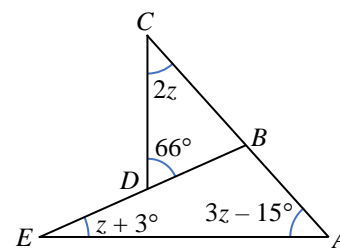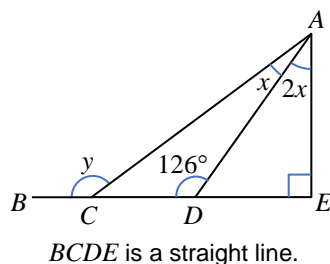[Original Exercise 8.1 Q18]
25.

[Original Exercise 8.1 Q19]
26.
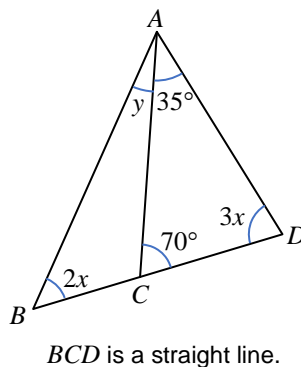
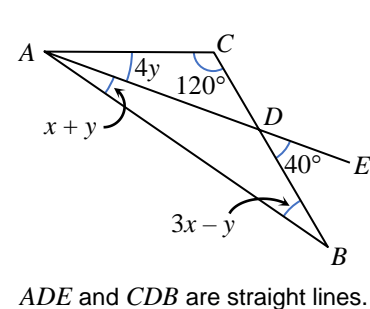In each of the following, find the unknowns. **(27 – 29)**

[Original Exercise 8.1 Q20]
27.

BCDE is a straight line.

[Original Exercise 8.1 Q21]
28.

BCD is a straight line.

[Original Exercise 8.1 Q22]
29.

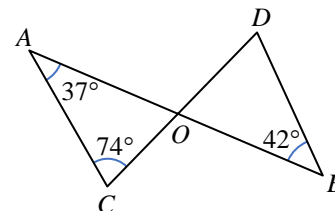*ADE* and *CDB* are straight lines.

[Original Exercise 8.1 Q23]
30. In $\triangle ABC$, $\angle A$ is greater than $\angle C$ by 25° and $\angle B$ is less than $\angle C$ by 10°. Find $\angle C$.

[Original Exercise 8.1 Q24]
31. In $\triangle XYZ$, $\angle X = 80°$, $\angle Y = p$ and $\angle Z = 3p$. Find the size of the greatest angle in $\triangle XYZ$.
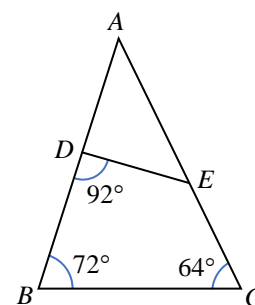
[Original Exercise 8.1 Q25]
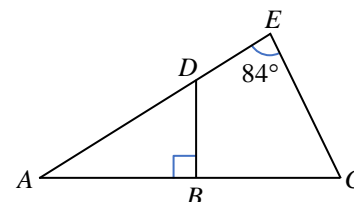**32.** In the figure, *AB* and *CD* intersect at point *O*. Find $\angle ODB$.

[Original Exercise 8.1 Q26]
33. In the figure, *D* and *E* are points lying on *AB* and *AC* respectively such that $\angle BDE = 92°$. Find $\angle AED$.
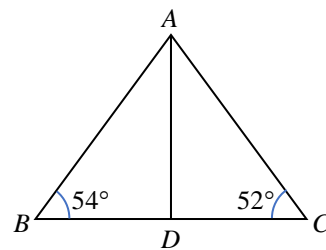
[Original Exercise 8.1 Q27]
34. In the figure, *B* and *D* are points lying on *AC* and *AE* respectively such that $DB \perp AC$. If $\angle BCE = 2\angle BAD$, find $\angle BDE$.
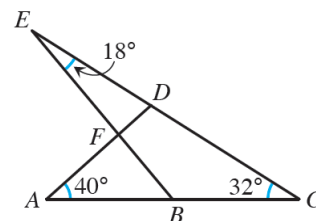
[Original Exercise 8.1 Q28]

(Explain) **35.** In the figure, D is a point lying on BC such that AD bisects $\angle BAC$. Ken claims that $\triangle ADC$ is a right-angled triangle. Do you agree? Explain your answer.
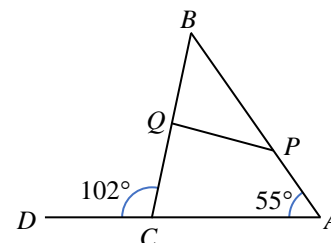
(Explain) **36.** In the figure, ABC, AFD, BFE and CDE are straight lines. Is AD perpendicular to BE? Explain your answer.
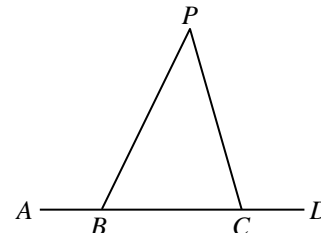
[Original Exercise 8.1 Q29]

37. In the figure, ACD is a straight line. P and Q are points lying on AB and BC respectively such that $\angle PQB$ is greater than $\angle PBQ$ by 46°. Find $\angle BPQ$.
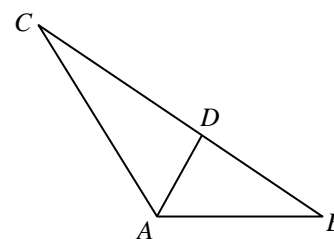
[Original Exercise 8.1 Q30]

38. In the figure, $ABCD$ is a straight line. It is given that $\angle ABP = 3x + 26°$, $\angle PCB = 3x - 16°$ and $\angle BPC = 2x - 18°$. Find $\angle PCB$.
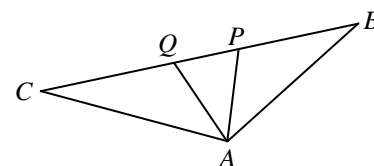
[Original Exercise 8.1 Q31]

39. In the figure, D is a point lying on BC such that AD bisects $\angle BAC$. If $\angle ABD = 34°$ and $\angle ACD = 24°$, find $\angle ADC$.

▲ Example 8.4

[Original Exercise 8.1 Q32]

40. In the figure, P and Q are points lying on BC such that $\angle CAQ = \angle PAQ = \angle BAP$. If $\angle ACB = 27°$ and $\angle ABC = 30°$, find $\angle APQ$ and $\angle AQP$.

SMART CORNER

[Original Exercise 8.1 Q33]

41. In $\triangle ABC$, $\angle BAC = 60°$ and $\angle ABC = 35°$. P is a point lying on BC such that $\angle APC = 75°$. Find $\angle PAC$.

[Original Exercise 8.1 Q34]

42. In $\triangle ABC$, $\angle ABC = 56°$ and $\angle BAC = \angle BCA$. Q is a point lying on AC such that $\angle ABQ = 18°$. Find $\angle BQC$.

[Original Exercise 8.1 Q35]

43. In $\triangle ABC$, $\angle ACB = 108°$ and $\angle BAC = 24°$. P and Q are points lying on AB and BC respectively such that $\angle APQ = 80°$. Find $\angle BQP$.

Answers