

Chapter 4 Basic Geometry

Multiple Choice Section

1. In geometry, which of the following is/are correct?

- I. A point is circular.
- II. The width of a line is really small.
- III. A plane has no thickness.

A. I B. III C. I and II D. I, II and III

2. How many complete turn(s) does 420° equal?

A. $\frac{5}{6}$ B. $\frac{1}{6}$ C. $1\frac{1}{6}$ D. $1\frac{1}{3}$

3. How many complete turn(s) does 630° equal?

A. $\frac{4}{7}$ B. $\frac{7}{4}$ C. $\frac{5}{4}$ D. $\frac{9}{8}$

4. How many right angles does 292.5° equal?

A. 3 right angles B. $2\frac{3}{4}$ right angles
C. $3\frac{1}{2}$ right angles D. $3\frac{1}{4}$ right angles

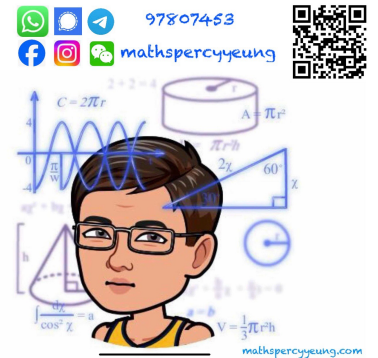
5. What type of angle is the sum of two angles of 135° ?

A. Straight angle B. Reflex angle
C. Obtuse angle D. Acute angle

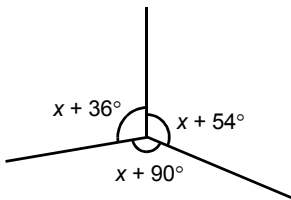
6. Peter has been waiting for Joanne from 8:10 p.m. to 11:20 p.m. Find the angle that the hour-hand has turned during this time.

(Hint: If the minute-hand turns a round, the hour-hand will move 30° .)

A. 85° B. 90° C. 95° D. 100°

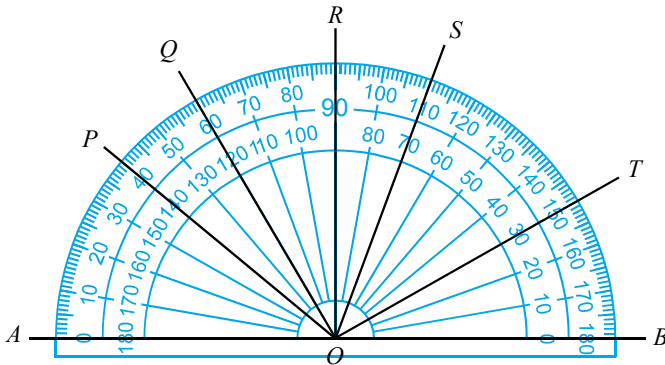


7. Find the greatest angle in the figure.



- A. 60° B. 96° C. 114° D. 150°

8. Which one of the following is a right angle?



- A. $\angle SOQ$ B. $\angle POS$ C. $\angle QOT$ D. $\angle TOP$

9. When using a protractor to draw an angle of 205° , which one of the following angles can be drawn first?

- A. 55° B. 65° C. 155° D. 165°

10. Which one of the following is not a property of triangles?

- A. 5 angles B. 3 angles C. 3 sides D. Sum of interior angles = 180°

11. Which of the following is/are correct?

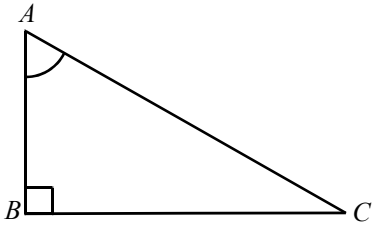
- I. A right-angled triangle can have a maximum of 1 right angle.
- II. A triangle can have all interior angles acute.
- III. A triangle can have more than 1 obtuse angle.

- A. I B. III C. I and II D. II and III

12. Which one of the following groups cannot be the three interior angles of a triangle?

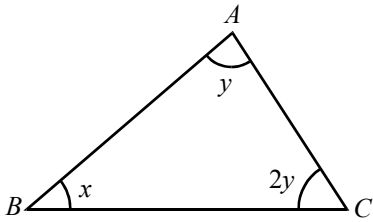
- A. $30^\circ, 50^\circ, 100^\circ$ B. $35^\circ, 45^\circ, 65^\circ$ C. $25^\circ, 55^\circ, 100^\circ$ D. $38^\circ, 60^\circ, 82^\circ$

13. In the figure, if $\angle BAC = 60^\circ$, find the sum of the three interior angles.



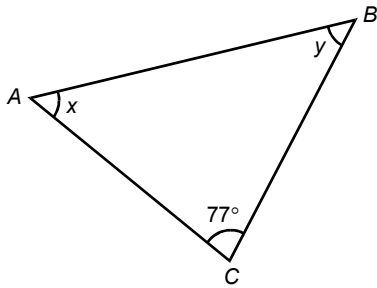
- A. 60° B. 120° C. 150° D. 180°

14. In the figure, if $y = 49^\circ$, find x .



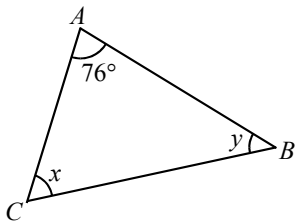
- A. 43° B. 82° C. 33° D. 28°

15. In $\triangle ABC$, find $x + y$.



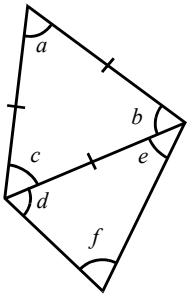
- A. 103° B. 167° C. 51.5° D. 257°

16. In $\triangle ABC$, express y in terms of x .



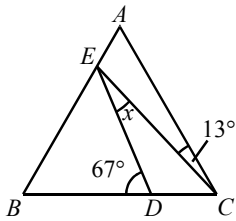
- A. $y = 104^\circ + x$ B. $y = 76^\circ + x$ C. $y = 104^\circ - x$ D. $y = 76^\circ - x$

17. According to the figure, which one of the following must be correct?



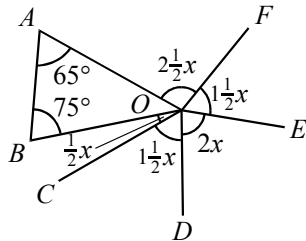
- A. $a + b + c + d + e + f = 180^\circ$ B. $a + f = 180^\circ$
 C. $b + e = c + d$ D. $a - f = (d - c) + (e - b)$

18. In the figure, ABC is a triangle. If $\angle ABC = \angle ACB = \angle BAC$, find the unknown in the figure.



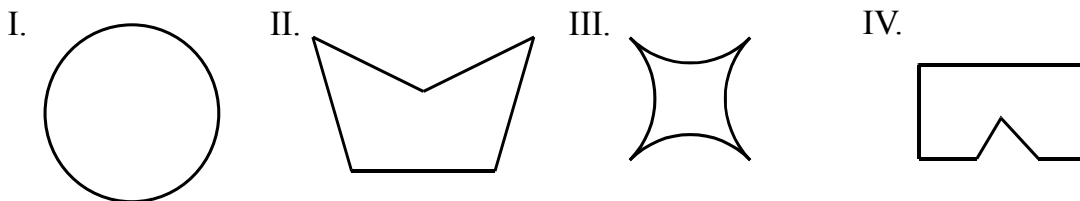
- A. 54° B. 13° C. 47° D. 20°

19. In the figure, AOB is a triangle, find $\angle FOA$.



- A. 200° B. 100° C. 60° D. 40°

20. Which one of the following is/are polygon(s)?



- A. I, III B. II, III C. II, IV D. I, II, III, IV

21. A polygon with 9 sides is called a/an

- A. hexagon B. heptagon C. octagon D. nonagon

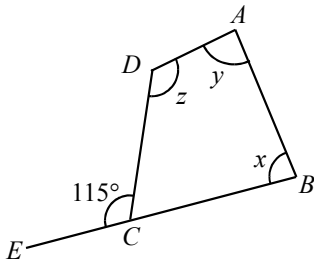
22. Which of the following is/are correct?

- I. Regular quadrilaterals must be convex quadrilaterals.
 - II. Equiangular quadrilaterals must be regular quadrilaterals.
 - III. Equilateral quadrilaterals must be regular quadrilaterals.
 - IV. Regular quadrilaterals must be equilateral quadrilaterals.
- A. I, IV B. II, IV C. II, III, IV D. I, II, III, IV

23. How many diagonals are there in a convex 12-gon?

- A. 54 B. 12 C. 24 D. 20

24. In the figure, ECB is a straight line. Express x in terms of y and z .

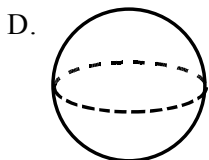
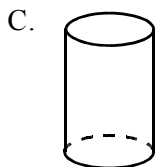
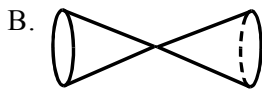
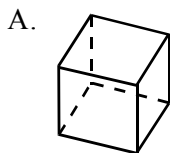


- A. $x = y + z$ B. $x = 295^\circ + y + z$ C. $x = 295^\circ - y - z$ D. $x = 245^\circ - y - z$

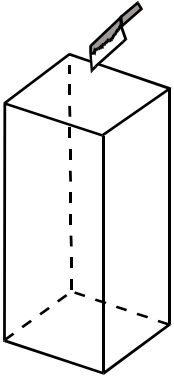
25. If the interior angles of a decagon are $15^\circ, 30^\circ, 45^\circ, 60^\circ, 75^\circ, 90^\circ, 105^\circ, 120^\circ, x^\circ, y^\circ$ respectively, find the value of $x + y$.

- A. 540 B. 800 C. 900 D. 1 260

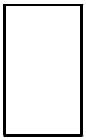
26. Which one of the following solids cannot roll?



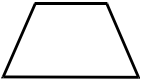
27. If a cuboid is cut as shown, the cross-section obtained is



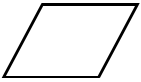
A.



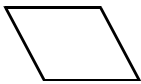
B.



C.

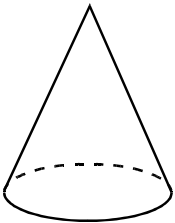


D.

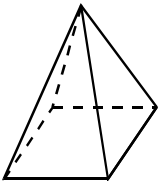


28. Which one of the following is not a polyhedron?

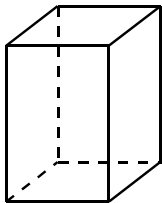
A.



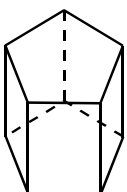
B.



C.



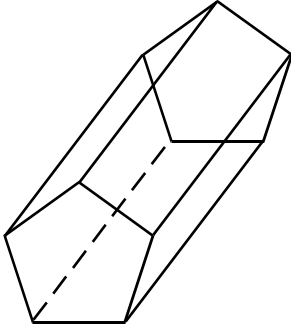
D.



29. How many vertices does a pentagonal prism have?

- A. 10 B. 8 C. 7 D. 6

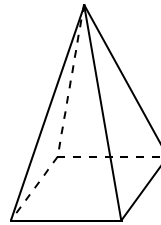
30. In the solid shown, number of vertices – number of edges + number of faces =



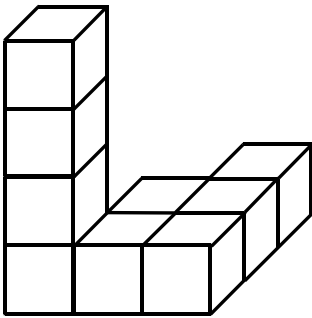
- A. 0 B. 1 C. 2 D. 3

31. In a square pyramid, number of vertices – number of edges + number of faces =

- A. 1 B. 2 C. 3 D. 4

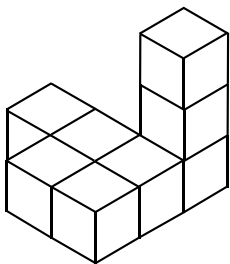


32. How many cubes does the solid below consist of?



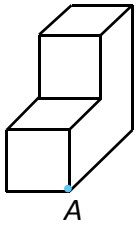
- A. 7 B. 8 C. 9 D. 10

33. How many cubes does the solid below consist of?

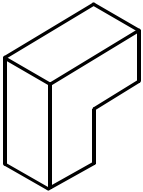


- A. 7 B. 8 C. 9 D. 10

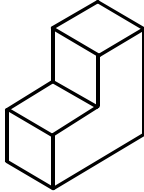
34. The solid below is drawn on an isometric grid, in which point “A” is drawn as the lowest point. Which one of the following would be the figure obtained?



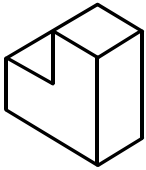
A.



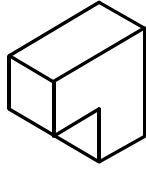
B.



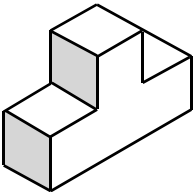
C.



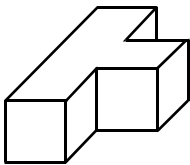
D.



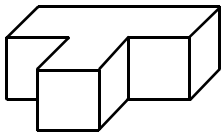
35. The solid below is drawn on an oblique grid, in which the shaded region is drawn as the front surface. Which one of the following would be the figure obtained?



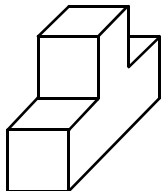
A.



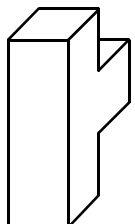
B.



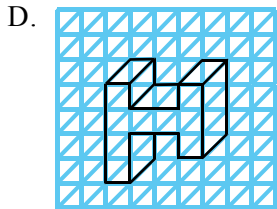
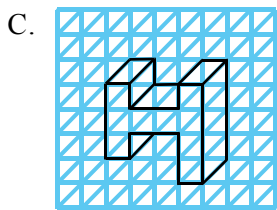
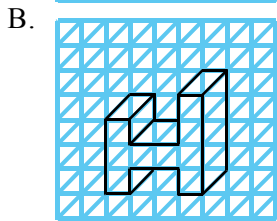
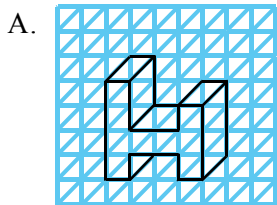
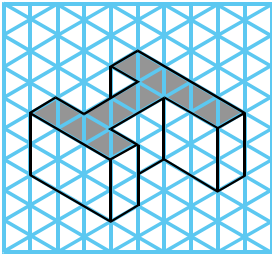
C.



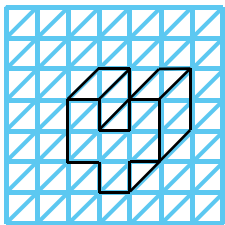
D.



36. The solid below is drawn on an oblique grid, in which the shaded region is drawn as the front surface. Which one of the following would be the figure obtained?



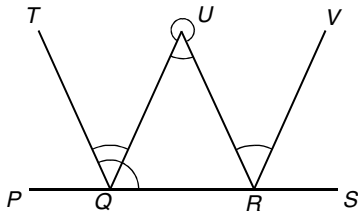
37. How many cuboids  does the solid below consist of?



- A. 3 B. 4 C. 5 D. 6

Section A(1)

1. Name all the marked angles in the figure.



2. Express the following angles in degrees.

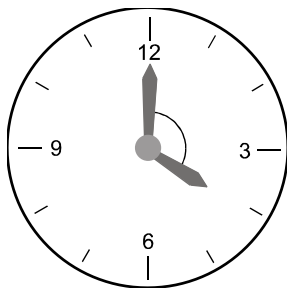
- (a) $\frac{1}{9}$ complete turn (b) $\frac{5}{8}$ complete turn (c) $2\frac{1}{2}$ complete turns

3. Express the following angles in degrees.

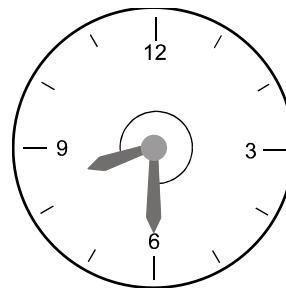
- (a) $\frac{1}{3}$ right angle (b) $1\frac{1}{4}$ right angles (c) $2\frac{1}{2}$ right angles

4. In each of the following figures, find the marked angle between the hour-hand and the minute-hand.
[Hint: The hour-hand will move 30° if the minute-hand turns a round.]

(a) Four o'clock

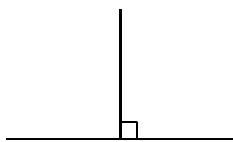


(b) Half past eight

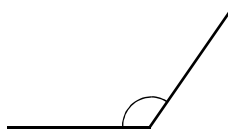


5. Classify the following marked angles.

(a)



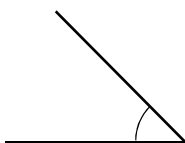
(b)



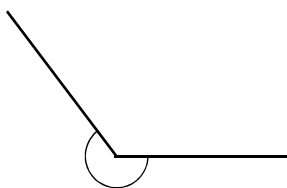
(c)



(d)



(e)



6. Classify the following angles.

(a) 3°

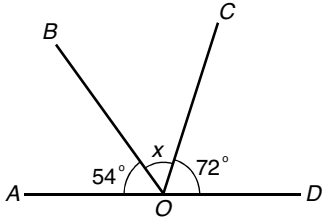
(b) 90°

(c) 165°

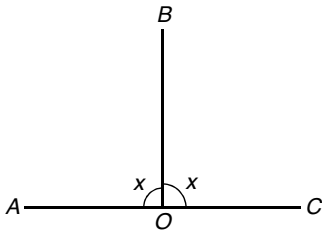
(d) 180°

(e) 275°

7. In the figure, AOD is a straight line. Find x .

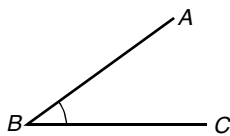


8. In the figure, AOC is a straight line. Find x .

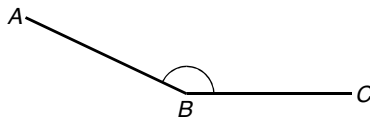


9. Use a protractor to measure the following marked angles and find their sizes.

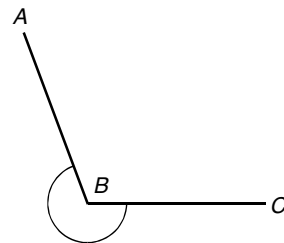
(a)



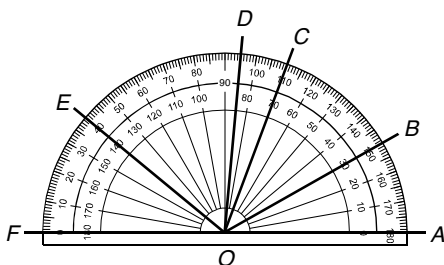
(b)



(c)



10. Read the sizes of the following angles in the figure.



(a) $\angle AOB$

(b) $\angle BOC$

(c) $\angle BOD$

(d) $\angle DOE$

(e) $\angle COF$

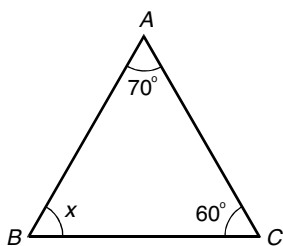
11. Use a protractor to draw the following angles.

(a) 45°

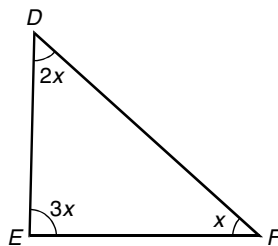
(b) 250°

12. Find x in each of the following triangles.

(a)



(b)



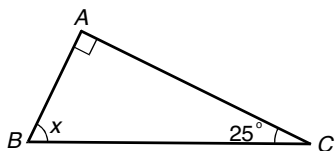
13. Find the remaining interior angle of $\triangle ABC$ if two of the interior angles are given as follows:

(a) $\angle A = 25^\circ$, $\angle B = 75^\circ$

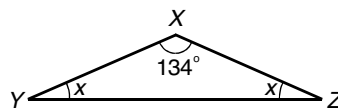
(b) $\angle A = 72^\circ$, $\angle B = 7^\circ$

14. Find x in each of the following triangles.

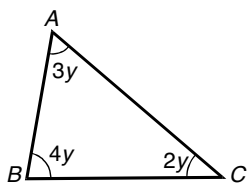
(a)



(b)

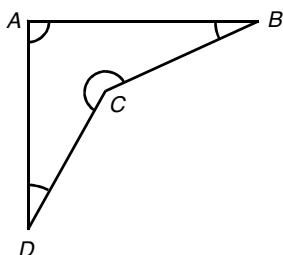


15. Find y in the following triangle.

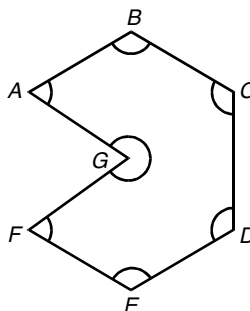


16. Find the sum of all interior angles in each of the following figures.

(a)

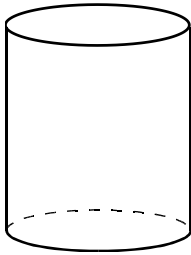


(b)

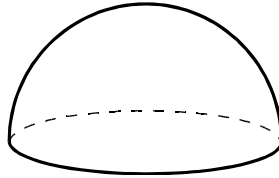


17. Write down the names of the following solids.

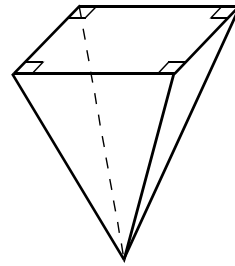
(a)



(b)



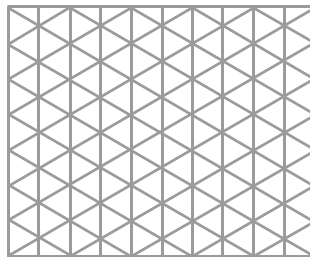
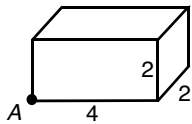
(c)



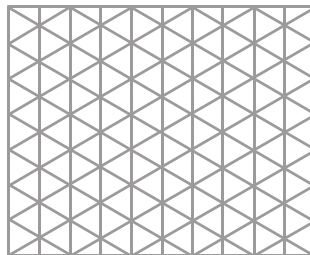
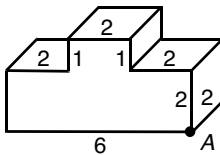
18. Using point “A” as the lowest point, draw the following solids on isometric grids. (The numbers in the figures show their sizes.)

[The following solids are formed by cubes.]

(a)



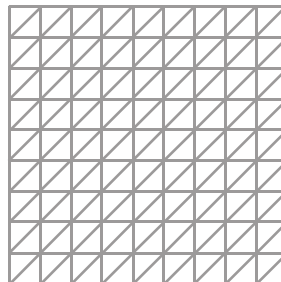
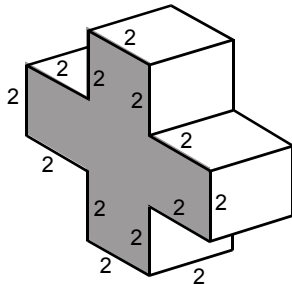
(b)



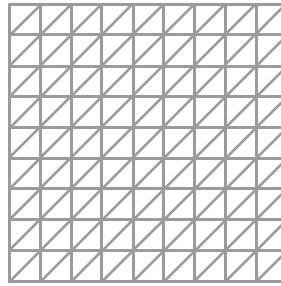
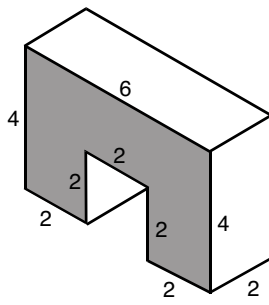
19. Using the shaded surface as the front surface, draw the following solids on oblique grids. (The numbers in the figures show their sizes.)

[The following solids are formed by cubes.]

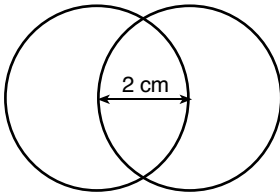
(a)



(b)

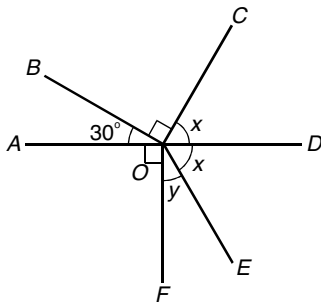


20. The figure is constructed with 2 circles of radii of 2 cm. Their centres are 2 cm apart. Draw the figure.



Section A(2)

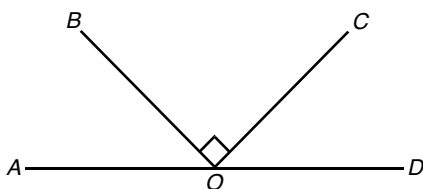
21. In the figure, AOD is a straight line.



(a) Find x .

(b) Find y .

22. In the figure, AOD is a straight line. $BO \perp OC$ and $\angle COD = \frac{2}{5} \angle BOC$.

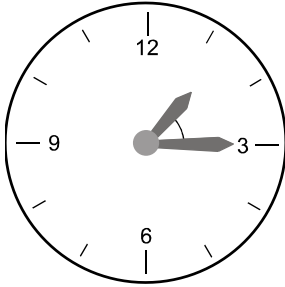


(a) Find $\angle COD$.

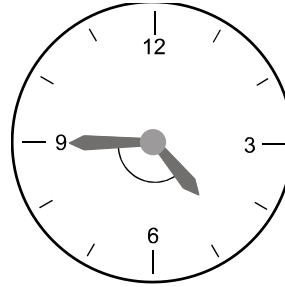
(b) Find $\angle AOB$.

23. In each of the following figures, find the marked angle between the hour-hand and the minute-hand. [Hint: The hour-hand will move 30° if the minute-hand turns a round.]

(a) A quarter past one



(b) A quarter to five

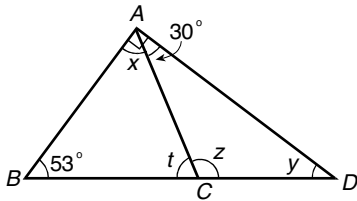


24. (a) Use a protractor to draw a straight angle AOB .

(b) Mark D within $\angle AOB$, then join OD and measure $\angle AOD$.

(c) Use the result of (b) to find $\angle BOD$.

25. In the figure, ABD is a triangle, $\angle BAD = 90^\circ$ and $\angle DAC = 30^\circ$.



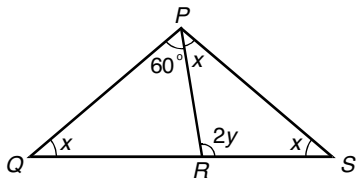
(a) Find x .

(b) Find y .

(c) Find z .

(d) Find t .

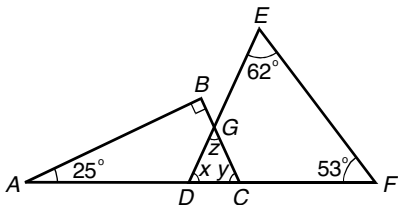
26. In the figure, PQS is a triangle.



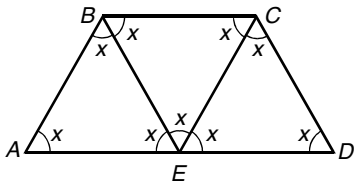
(a) Find x .

(b) Find y .

27. In the figure, ABC and DEF are triangles, find x , y and z .



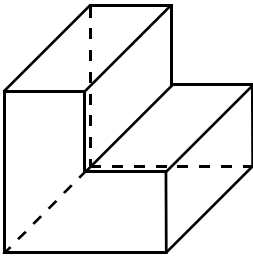
28. In the figure, ABE , BCE and ECD are triangles.



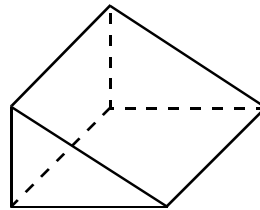
- (a) Find x .
 (b) Is AED a straight line? Explain your answer.

29. Copy the following prisms, and colour the uniform cross-section of each prism.

(a)

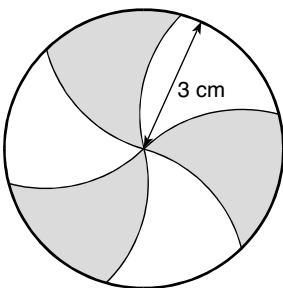


(b)



30. (a) Find the numbers of edges(E), faces(F) and vertices(V) in a regular hexahedron.
 (b) Hence, find the value of $V - E + F$.

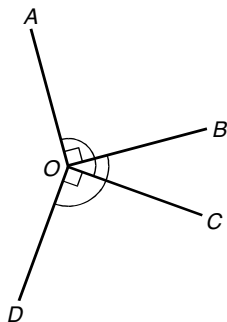
31. The figure is constructed with circle of radii 3 cm. Draw the figure.



32. (a) Construct a triangle ABC where $AB = AC = 5$ cm and $BC = 8$ cm.
 (b) Use a set square to construct a straight line which passes through A and is perpendicular to BC .
 (c) Measure the shortest distance from A to BC .

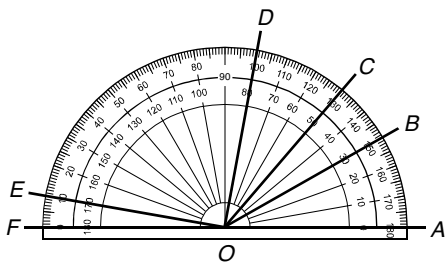
Section B

33. In the figure, $\angle AOB = \angle COD = 90^\circ$.



- (a) Is $\angle AOC = \angle BOD$?
- (b) If $\angle AOC = 125^\circ$, find $\angle BOC$.
- (c) Find reflex $\angle AOD$.

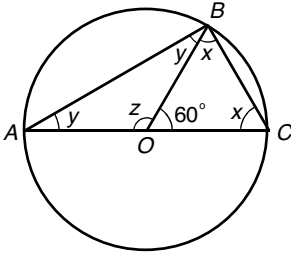
34. Referring to the figure, answer the following questions.



- (a) Read the sizes of the following angles in the figure.

(i) $\angle AOB$	(ii) $\angle FOE$	(iii) $\angle BOC$
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- (b) Name 5 angles with OB as an arm.
- (c) Which angle is a right angle?
- (d) Which angle has the same size as $\angle AOB$?
- (e)
 - (i) Find $\angle AOB + \angle BOF$.
 - (ii) Find $\angle AOC + \angle COF$.
 - (iii) Find $\angle AOB + \angle BOC + \angle COF$.
 - (iv) Use the results of (e)(i), (e)(ii) and (e)(iii), what do you notice?
- (f) Without finding the individual angle, find the sum of the following angles.
 - (i) $\angle AOD + \angle DOF$
 - (ii) $\angle AOB + \angle BOC + \angle COD + \angle DOE + \angle EOF$

35. In the figure, O is the centre, $\angle AOC$ is a straight angle, and $\angle BOC = 60^\circ$.



- (a) Find x , y and z .
- (b) Find $\angle ABC$.
- (c) Which one is a right-angled triangle?
- (d) Which one is an isosceles triangle?
- (e) Which one is an equilateral triangle?