

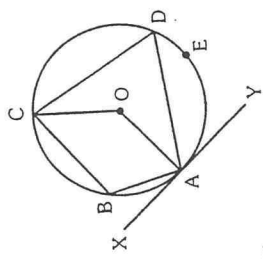
ANSWERS / CROSSWORD / ANSWERS

EXERCISE 2.1

In the following exercises, the dots in the diagrams represent the centre of the circles.

1. From the diagram, name:

- (a) an angle in a major arc $\angle CDA$ or $\angle BCD$
- (b) an angle in a minor arc $\angle ABC$ or $\angle BAD$
- (c) a right angle $\angle OAX$ or $\angle OAY$
- (d) an angle half the reflex size of angle COA. $\angle ABC$



2. Copy and complete each of the following converse properties.

- (a) If two chords are equidistant from the centre of a circle, then they are congruent.
- (b) If the opposite angles of a quadrilateral are supplementary, then the quadrilateral is cyclic.
- (c) If a chord is perpendicular to a line containing the centre of a circle, then it is bisected by that line.

3. Solve for each unknown.

(a) $a = 90$
 $b = 73$

(b) $c = 35$

(c) $d = 60$
 $e = 100$

(d) $f = 260$
 $g = 50$

(e) $h = 35$
 $i = 62$
 $j = 83$

(f) $k = 120$

(g) $n = 36$

(h) $p = 6$

4. Find the value of the unknowns in each of the following.

(a) $k = 70$
 $m = 35$

(b) $d = 5$
 $e = 8$

(c) $s = 60$
 $t = 60$

(d) $x = 135$
 $y = 110$

(e) $g = 30$
 $h = 90$

(f) $a = 54$
 $b = 54$
 $c = 72$

(g) $m = 45$
 $n = 45$
 $k = 45$

(h) $f = 112$
 $g = 115$

(i) $p = 37$
 $q = 106$

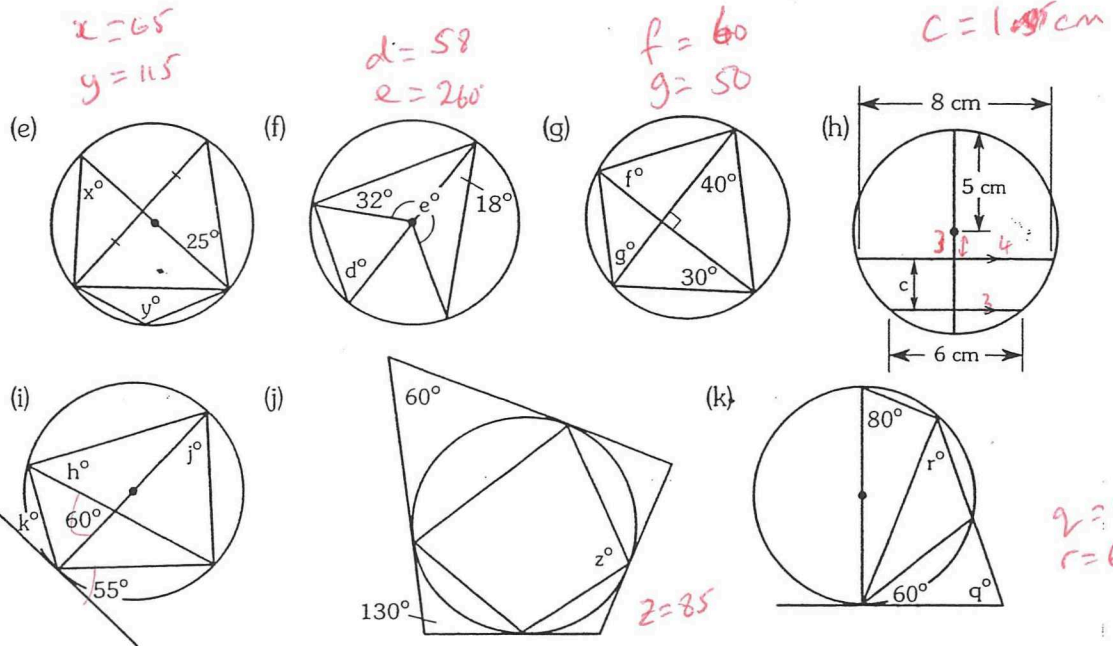
5. Find the value of each unknown.

(a) $a = 50$
 $b = 50$
 $c = 260$

(b) $d = 47$
 $e = 47$
 $f = 47$

(c) $g = 110$
 $h = 70$

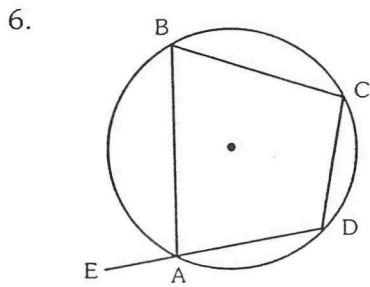
(d) $i = 55$
 $j = 63$



$h = 35$
 $j = 55$
 $k = 25$

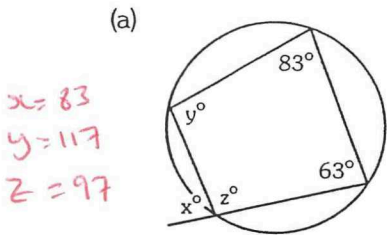
$z = 85$

$r = 40$
 $r = 60$

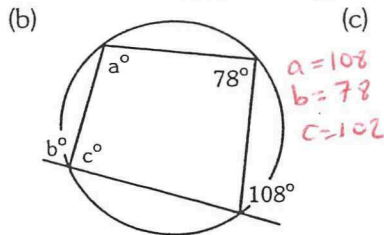


6. (a) For cyclic quadrilateral ABCD as shown, what is the relationship between angles:
 (i) BCD and BAD *Supp*
 (ii) BAE and BAD *supp*
 (iii) BCD and BAE? *cong.*
- (b) Should a similar result to (iii) hold for any exterior angle of any cyclic quadrilateral? *Yes*
- (c) Copy and complete. "An exterior angle of a cyclic quadrilateral is congruent to the interior opposite angle."

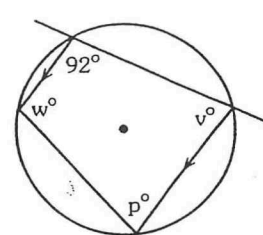
7. Find the values of the unknowns in each of the following:



$x = 83$
 $y = 117$
 $z = 97$



$a = 102$
 $b = 78$
 $c = 102$



$p = 88$
 $v = 88$
 $w = 92$

8. Chords XY and TQ of a circle centre O intersect at M with $s\angle TQY = 75^\circ$ and $s\angle TMX = 40^\circ$. Find:

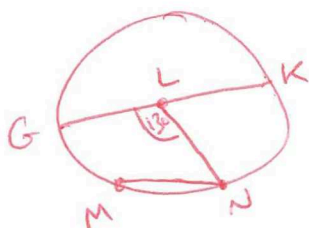
- (a) $s\angle MYQ$ *65* (b) $s\angle XTM$ *65* (c) $s\angle TOY$ *150*

9. A circle centre O contains points D and E in the major arc CF and M in the minor arc CF. Given $s\angle CMF = 110^\circ$, find:

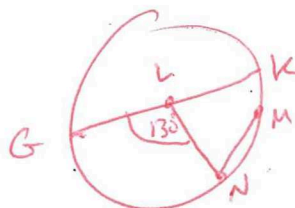
- (a) $s\angle CDF$ *70* (b) $s\angle CEF$ *70* (c) $s\angle COF$ *140*

10. GK is a diameter of a circle centre L and \overline{MN} is a non-intersecting chord. If $s\angle GLN = 130^\circ$, calculate $s\angle KMN$. (Hint: There are two possible solutions to this problem.)

25 or 155



or



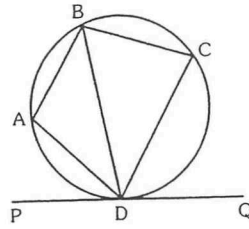
EXERCISE 2.2

Answers

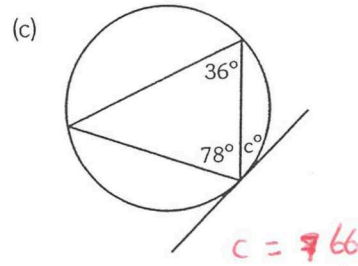
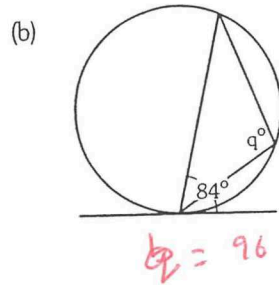
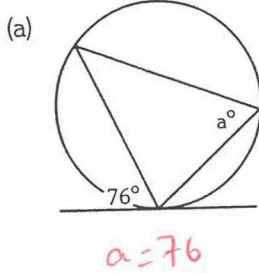
Assume in the following exercises that a line which appears to be a tangent is a tangent, and that a bold dot indicates the centre of the circle.

1. Name the angle in the alternative segment to each of the following:

- (a) $\angle BDP$ $\angle BCD$ (b) $\angle QDB$ $\angle BAD$
 (c) $\angle CDQ$ $\angle CBD$ (d) $\angle ADP$ $\angle ABD$

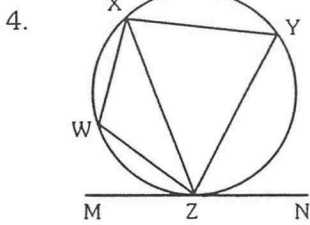


2. Find the value of the unknown in each of the following.



3. (a) Draw a cyclic quadrilateral ABCD within a circle with a tangent PQ intersecting the circle at A, forming acute angles PAB and QAD.

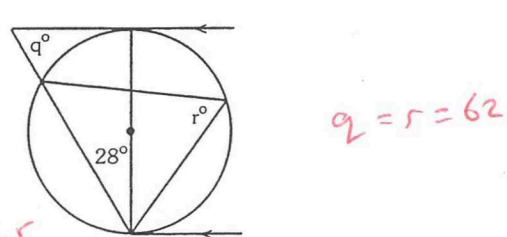
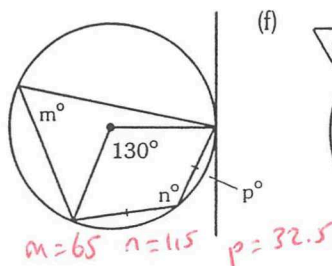
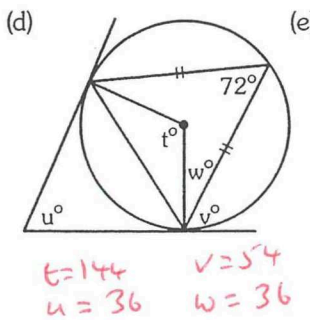
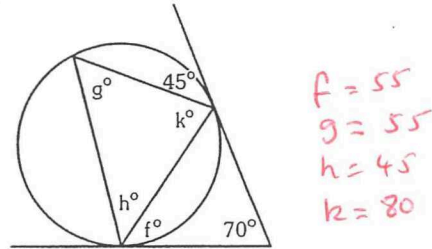
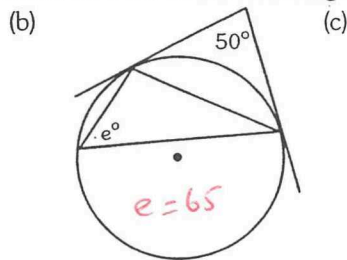
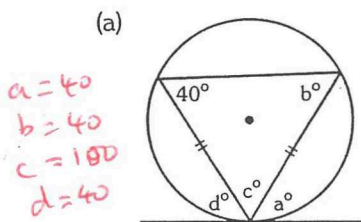
- (b) Name the two segments determined by diagonal AC. ABC and ADC
 (c) Name the segment which is alternate to (i) $\angle CAQ$ (ii) $\angle CAP$.
 (d) State an angle which is congruent to (i) $\angle CAQ$ (ii) $\angle ADC$.



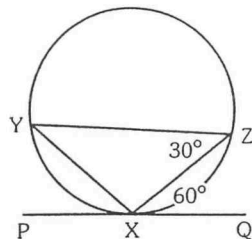
Given $s\angle YZN = 62^\circ$, $s\angle XZW = 24^\circ$ and $s\angle XZY = s\angle MZW$, find:

- (a) $s\angle XZY$ 47 (b) $s\angle XZM$ 71 (c) $s\angle XYZ$ 71
 (d) $s\angle WXZ$ 47 (e) $s\angle XWZ$ 109

5. Find the value of the unknowns in each of the following:



6. Prove $s\angle YXZ = 90^\circ$.

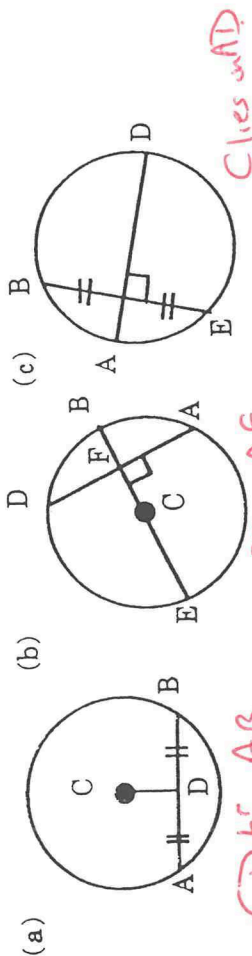


7. Use the angle in the alternate segment property to prove that the angle in a semi-circle is a right angle.

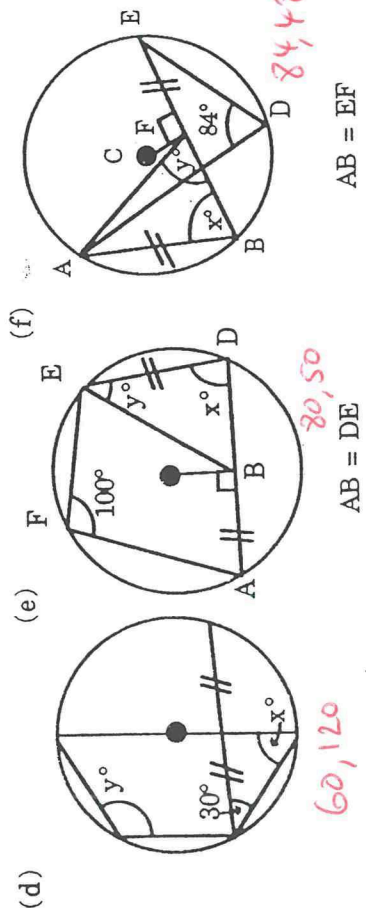
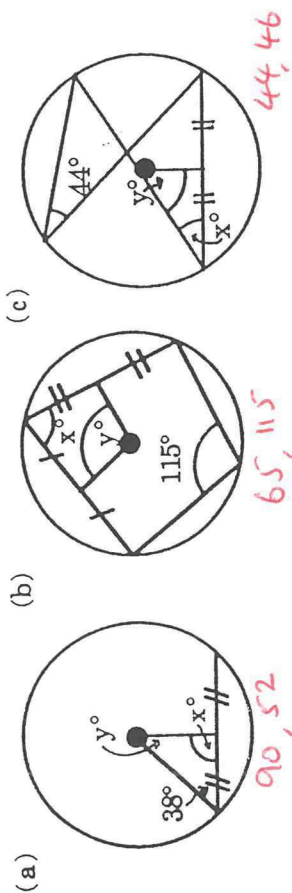
DEVELOPMENTAL MATHS 5.3

EXERCISE 11A

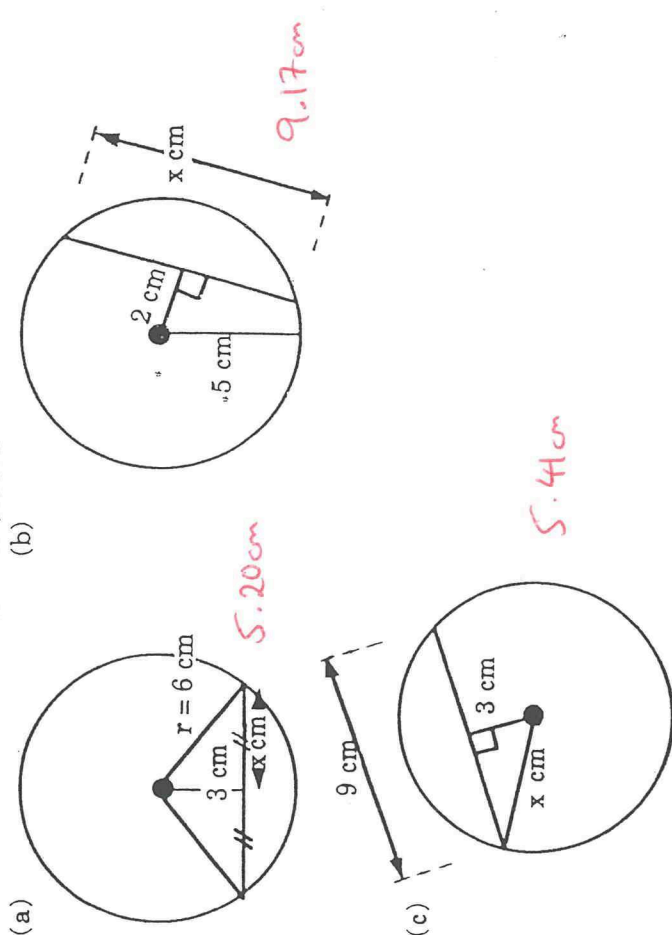
1. In each of the following diagrams you are given certain information about a circle, centre C. For each part write down one more fact that must be true but that is not explicitly stated on the diagram.



2. Find the values of x and y in each of the following.



3. Find the value of x in each of the following, giving answers in centimetres correct to 2 decimal places.



4. A chord of length 14 cm is drawn in a circle of radius 10 cm. How far is the chord from the centre of the circle? → 7.14 cm

5. A chord AB is drawn in a circle centre C, radius 8 cm. Given that the chord is 3.5 cm from C find the length of the chord. → 14.39 cm

6. AB and DE are two parallel chords of a circle centre C, radius 10 cm. The chords lie on the same side of C and are respectively 6 cm and 4 cm from C. How far apart are the chords? Determine the length of each chord. → 2 cm, 16 cm, 18.3 cm

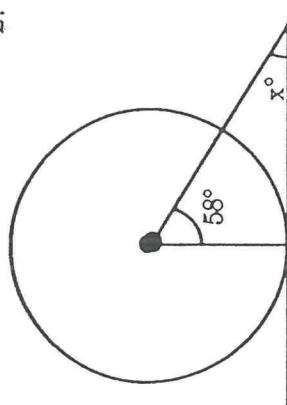
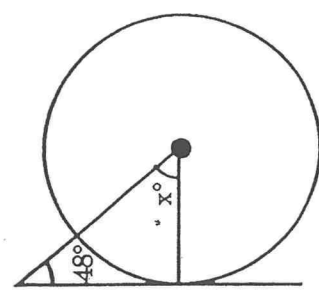
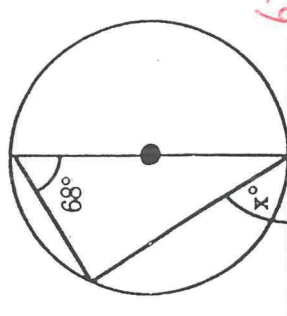
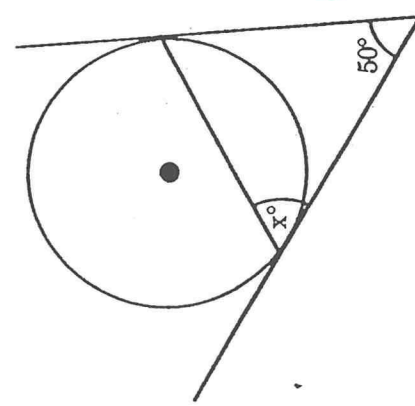
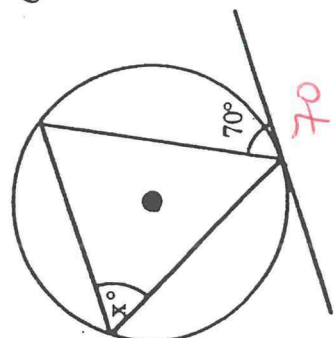
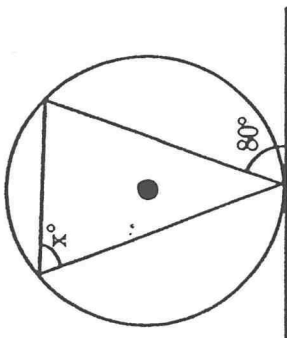
7. AB and DE are parallel chords in a circle centre C, radius 7 cm. The chords lie on opposite sides of C and are respectively 5 cm and 2 cm from C. Find the distance the chords are apart. Determine the length of each chord. → 7 cm, 9.8 cm, 13.4 cm

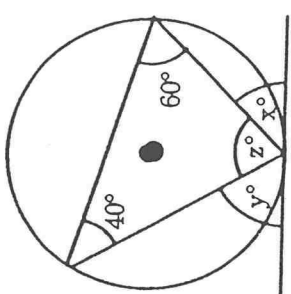
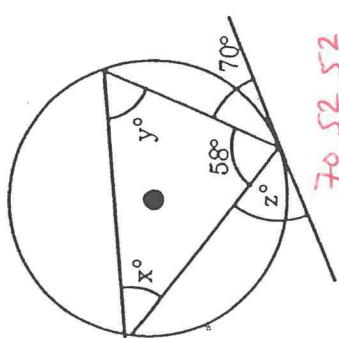
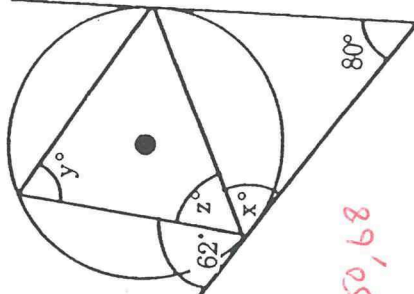
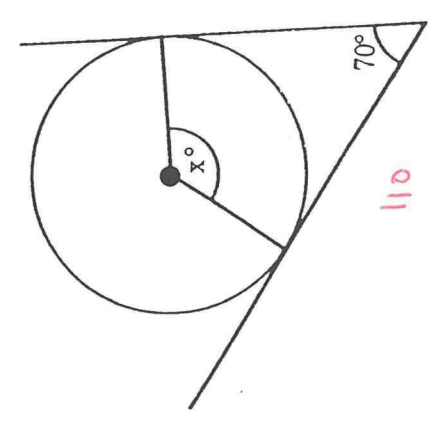
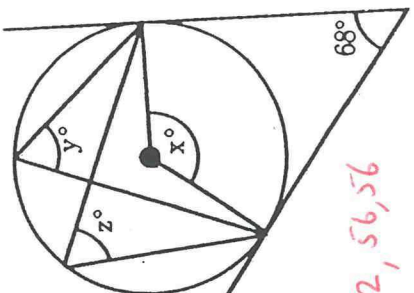
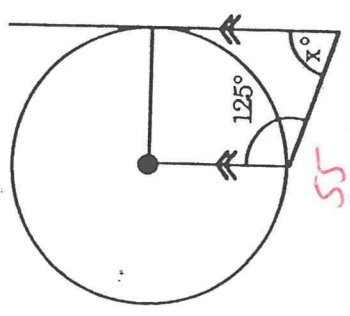
8. AB and DE are two perpendicular chords in a circle centre C, radius 10 cm. AB is of length 12 cm and DE is of length 16 cm. If the two chords intersect at point F find the length of CF. → 10 cm



EXERCISE 11B

Find the values of the pronumerals in each of the following.

1.  32
2.  42
3.  68
4.  65
5.  70
6.  80

7.  40, 60, 80
8.  70, 52, 52
9.  50, 50, 68
10.  110
11.  112, 56, 56
12.  55

