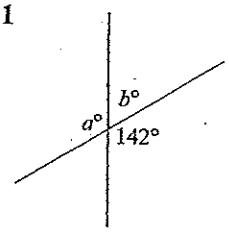
Worksheet 3-02 Find the missing angle 1

- Complementary and supplementary angles
- Vertically opposite angles
- Angles at a point
- Corresponding, alternate and co-interior angles

Find the value of the pronumeral in each diagram.

1



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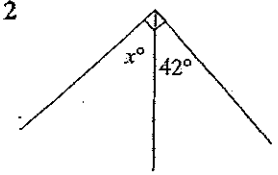

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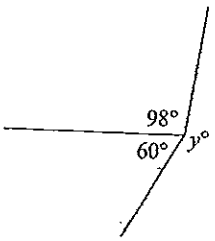

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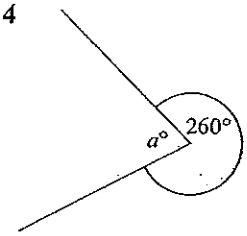

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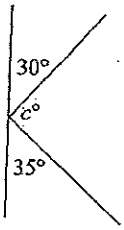

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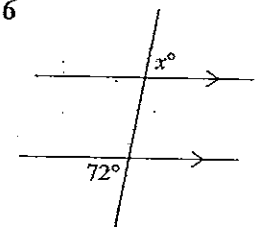

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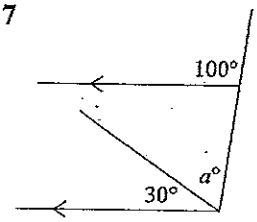

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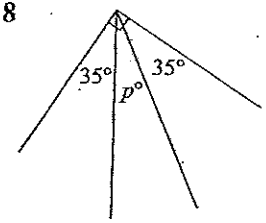

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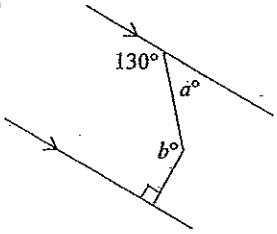

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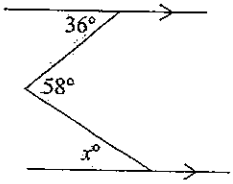

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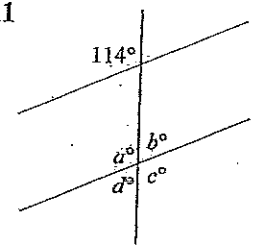

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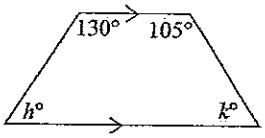

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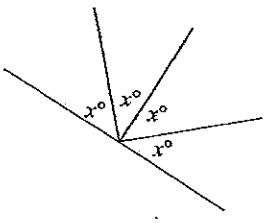

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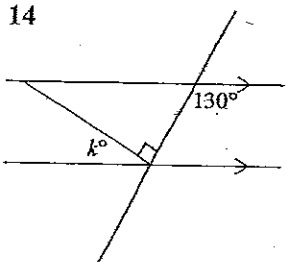

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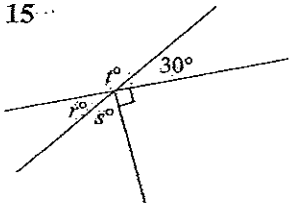

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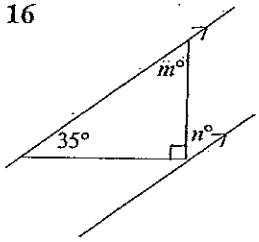

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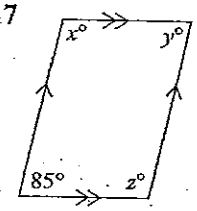

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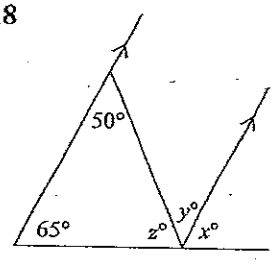

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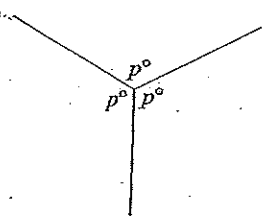

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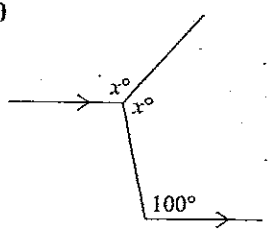

Worksheet 3-03 Triangle geometry

- Angle sum of a triangle
- Equilateral and isosceles triangles
- Exterior angle of a triangle

Find the value of the pronumeral in each diagram.

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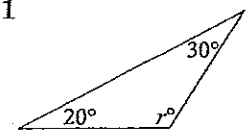

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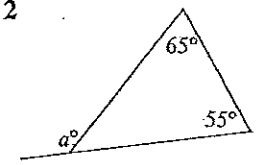

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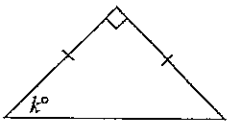

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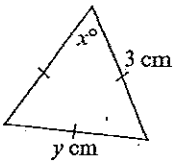

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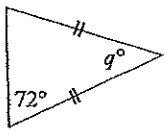

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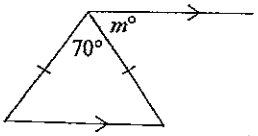

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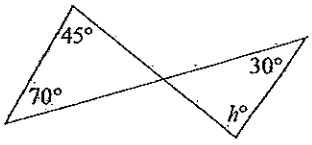

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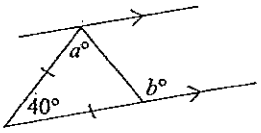

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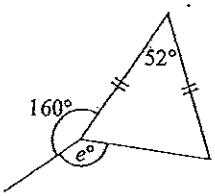

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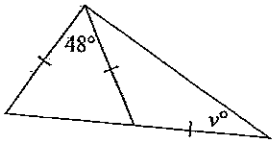

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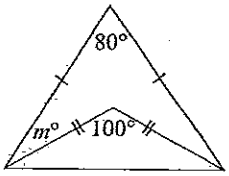

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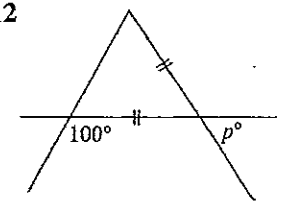

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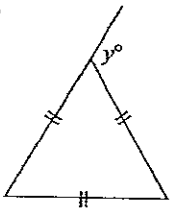

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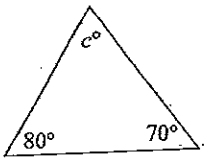

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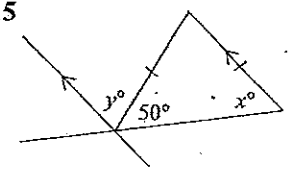

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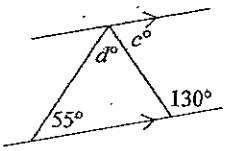

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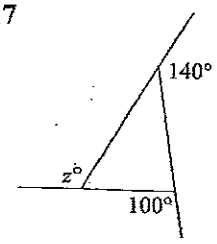

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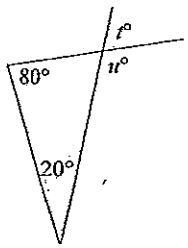

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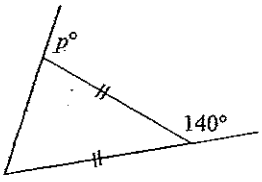

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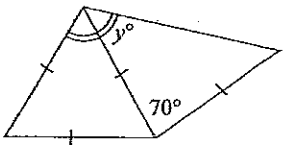

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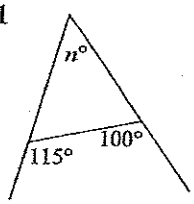

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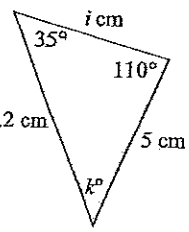

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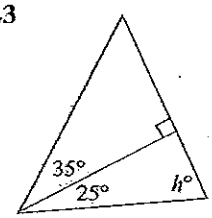

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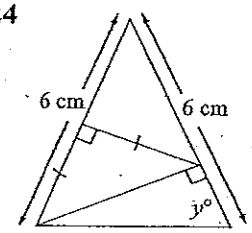
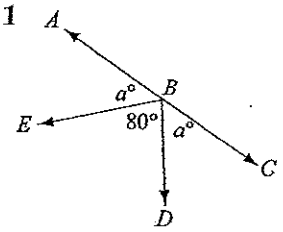


Worksheet 3-07 Find the missing angle 2

- Complementary and supplementary angles
- Vertically opposite angles
- Angles at a point
- Corresponding, alternate and co-interior angles
- Angle sums
- Equilateral and isosceles triangles
- Quadrilaterals

Find the value of the pronumeral in each diagram.

1



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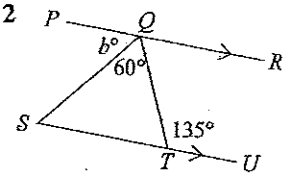

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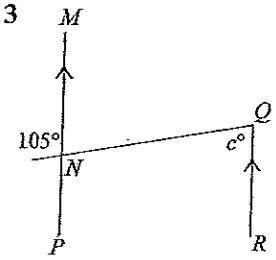

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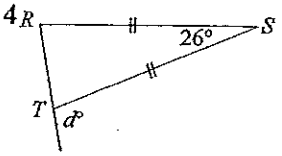

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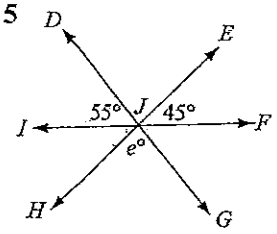

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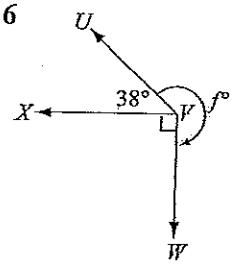

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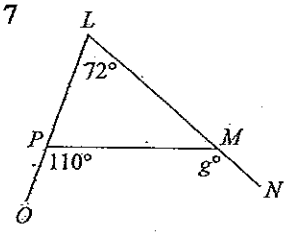

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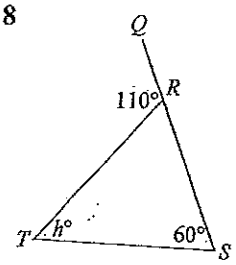

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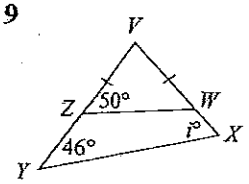

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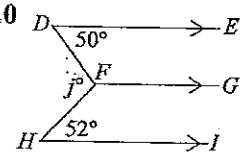

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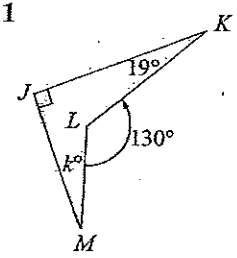

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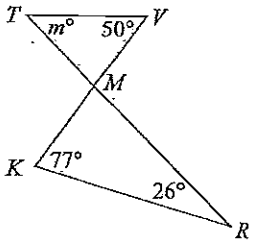

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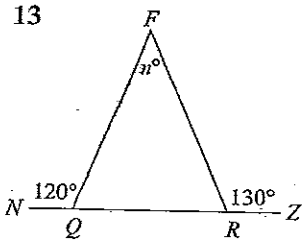

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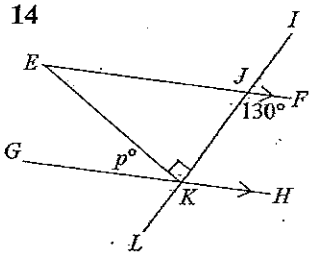

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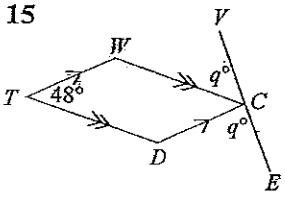

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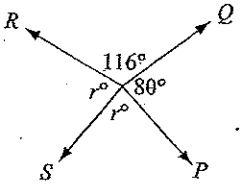

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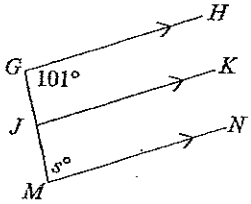

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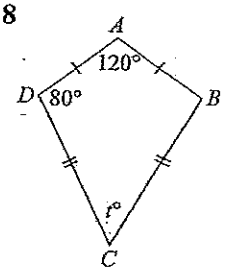

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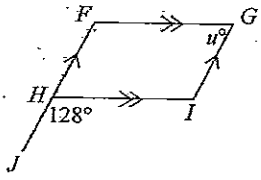

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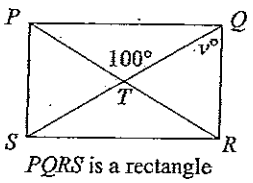
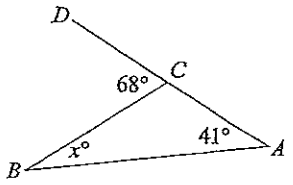


PQRS is a rectangle

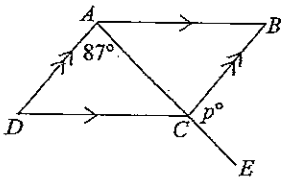
Worksheet 3-08 Deductive geometry

On a sheet of paper or in your book, carefully write out the solutions to each of the following deductive geometry problems, listing reasons for each step.

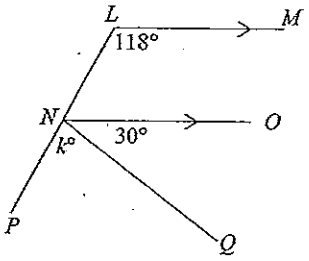
1 Find x.



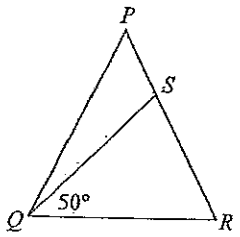
2 Find p.



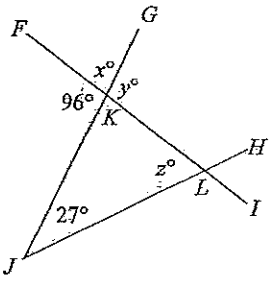
3 Find k.



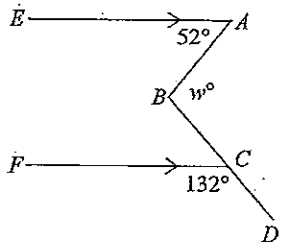
4 $PQ = PR$, $QR = QS$. Find $\angle QPR$.



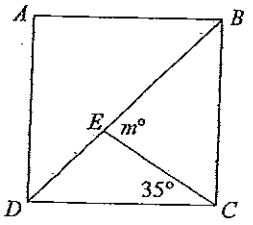
5 Find x, y, z.



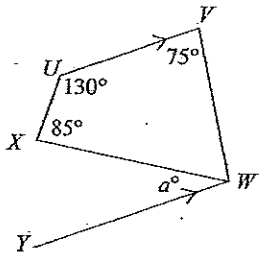
6 Find w.



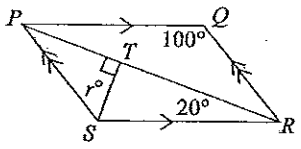
7 $ABCD$ is a square. Find m.



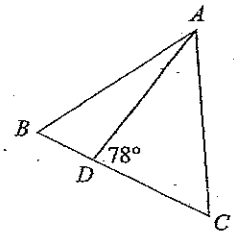
8 Find a.



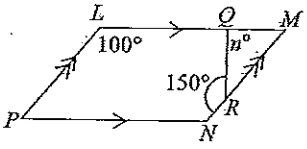
9 Find r.



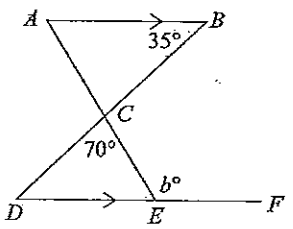
10 Triangle ABC is equilateral. Find all angles in ΔADC and in ΔABD.



11 Find n.



12 Find b.

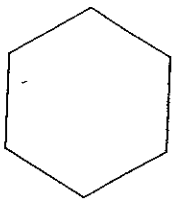


Worksheet 3-09 Angle sum of a polygon

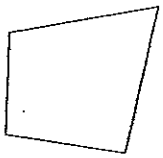
A polygon with n sides has an angle sum (A) of $A = 180(n-2)°$

1 Use the formula above to calculate the angle sum of these figures.

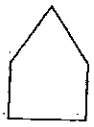
a



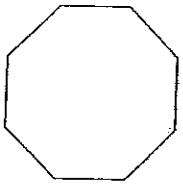
b



c



d



2 Calculate the angle sum of:

a a decagon **b** a triangle

c a heptagon **d** a dodecagon

3 Calculate the angle sum of a polygon with:

a 16 sides **b** 9 sides

c 21 sides **d** 25 sides

e 100 sides **f** 58 sides

4 Find the number of sides of the polygon that has an angle sum of:

a 900° **b** 2340°

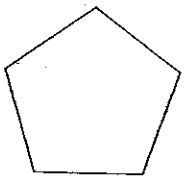
c 3060° **d** 6840°

5 a What is the angle sum of a regular octagon?

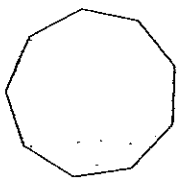
b So what is the size of one of these angles?

6 Find the size of one angle in each of these regular polygons.

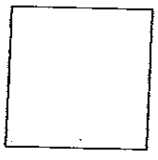
a



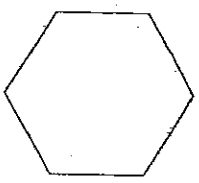
b



c



d



7 Calculate the size of one angle in a regular polygon with:

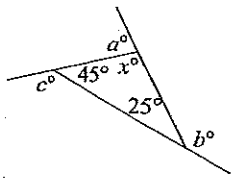
a 12 sides **b** 30 sides

c 15 sides **d** 24 sides

8 Find the number of sides of the regular polygon that has equal angles of size:

a 140° **b** 150° **c** 162° **d** 170°

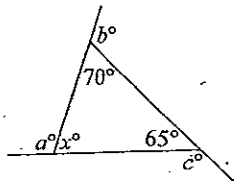
9 This triangle has three exterior angles, $a°$, $b°$ and $c°$.



a Find the values of x, a, b and c.

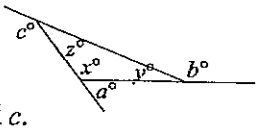
b What is $a+b+c$, the exterior angle sum of the triangle?

10 a Find x, a, b and c for this triangle.



b What is $a+b+c$?

11 a Write a possible value of each of x, y and z.

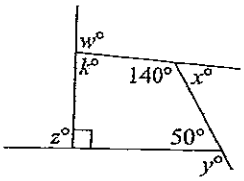


b Hence find a, b and c.

c What is $a+b+c$?

d Complete: The exterior angle sum of any triangle is _____°.

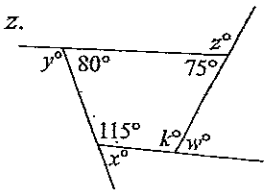
12 This quadrilateral has four exterior angles: $w°$, $x°$, $y°$ and $z°$.



a Find the values of k, w, x, y and z.

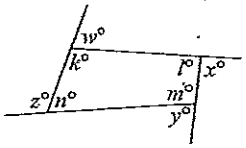
b What is $w+x+y+z$, the exterior angle sum of the quadrilateral?

13 a Find k, w, x, y and z.



b What is $w+x+y+z$?

14 a Write a possible value for each of k, l, m and n.



b Hence find w, x, y and z.

c What is $w+x+y+z$?

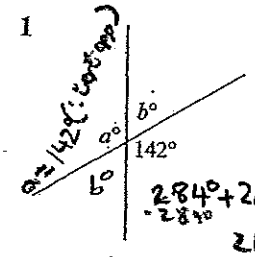
d Complete: The exterior angle sum of any quadrilateral is _____°.

Worksheet 3-02 Find the missing angle 1

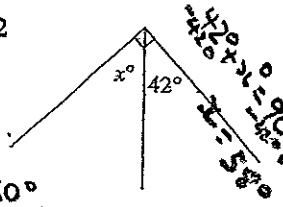
- Complementary and supplementary angles
- Vertically opposite angles
- Angles at a point
- Corresponding, alternate and co-interior angles

Moaz 8X

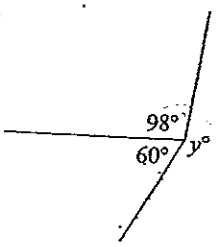
Find the value of the pronumeral in each diagram.

1


a=142° (vert opp)
284°+2b=360°
-284° -284°
2b=
b°=38°

2


x+42°=90° (∠ in right angle)
x=48°

3


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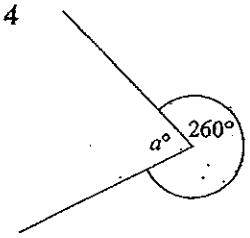

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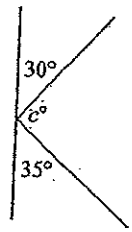
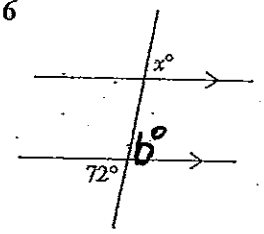


6


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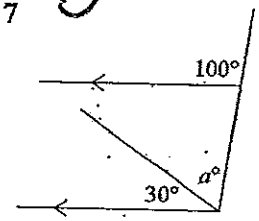

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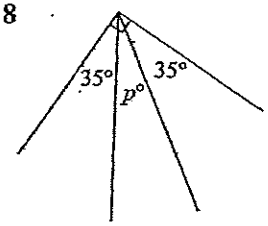

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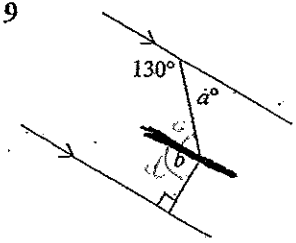

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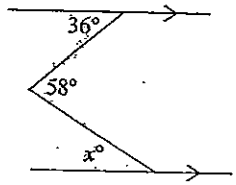

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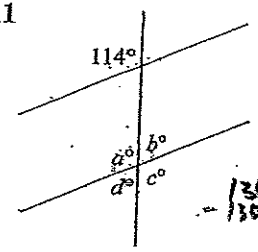
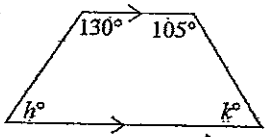
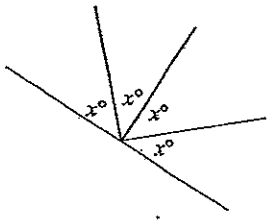


a=130° (alt ∠s)
130°+b°=180°
-130° -130°
b°=50°

12


105+k°=180°
-105° -105°
k=75°

13


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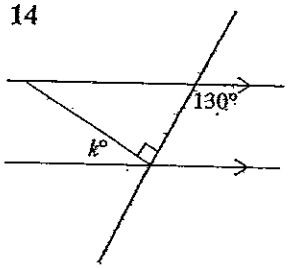

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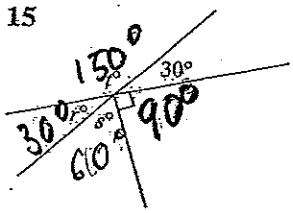

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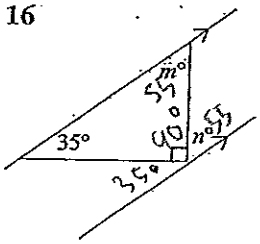

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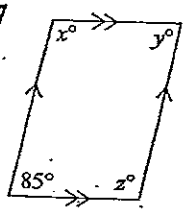

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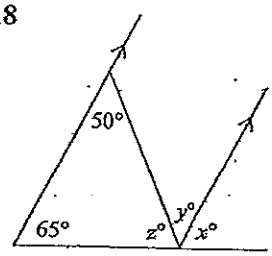

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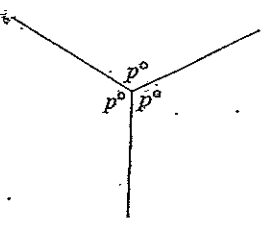

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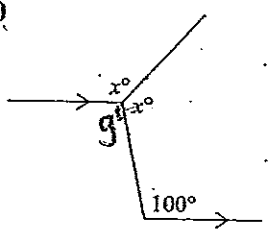


$60^\circ + y^\circ = 360^\circ$ (∠s at a point)

$-158^\circ \quad -158^\circ$

$y^\circ = 202^\circ$ ✓

4.) $360^\circ - 260^\circ = 100^\circ$ ✓

5.) $30^\circ + 35^\circ + c^\circ = 180^\circ$ (∠s straight line)

$65^\circ + c^\circ = 180^\circ$

$-65^\circ \quad -65^\circ$

$c^\circ = 115^\circ$ ✓

6.) $b^\circ = 72^\circ$ (∠s vert opp) ✓

$x^\circ = 72^\circ$ (∠s corresponding to b°) ✓

7.) $30^\circ + a^\circ = 100^\circ$ (∠s corresponding)

$-30^\circ \quad -30^\circ$

$a^\circ = 70^\circ$ ✓

8.) $35^\circ + 35^\circ + p^\circ = 90^\circ$ (∠s right angle)

$70^\circ + p^\circ = 90^\circ$

$-70^\circ \quad -70^\circ$

$p^\circ = 20^\circ$ ✓

9.) $130^\circ + b^\circ = 180^\circ$ (∠s co-interior)

$b^\circ = 50^\circ$

$90^\circ + db^\circ = 180^\circ$ (∠s co-interior)

$db^\circ = 90^\circ$

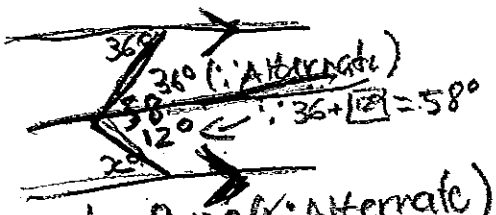
Total $= 90^\circ + 50^\circ$

$b^\circ = 140^\circ$ ✓

$a^\circ = 140^\circ$ (∠s Alternate to b°)

50°

10.)



$36 + \square = 58$

$\therefore x^\circ = 12^\circ$ (∠s Alternate)

11.) $a = 114^\circ$ (∠s corresponding angles)

$114^\circ + b^\circ = 180^\circ$ (∠s straight line)

$-114^\circ \quad -114^\circ$

$b^\circ = 66$ ✓

$c^\circ = 114^\circ$ (∠s vert opp to a°)

$d^\circ = 66^\circ$ (∠s vert opp to b°)

12.) $x^\circ + x^\circ + x^\circ + x^\circ = 180^\circ$ (∠s straight line)

$4x^\circ = 180^\circ$ ✓

$x^\circ = 45^\circ$ ✓

13.) $r^\circ = 30^\circ$ (∠s Vert opp to 30°) ✓

$s^\circ + 90^\circ + 30^\circ = 180^\circ$ (∠s straight line) ✓

$s^\circ + 120^\circ = 180^\circ$

$-120^\circ \quad -120^\circ$

$s^\circ = 60^\circ$ ✓

$t^\circ + 30^\circ = 180^\circ$ (∠s straight line) ✓

$-30^\circ \quad -30^\circ$

$t = 150^\circ$ ✓

14.) $k^\circ + 90^\circ = 130^\circ$ (∠s vert opp + corr. ∠s)

$-90^\circ \quad -90^\circ$

$k^\circ = 40^\circ$ ✓

16.) $35^\circ + m^\circ + 90^\circ = 180^\circ$ (∠s angle sum of triangle) ✓

$125^\circ + m^\circ = 180^\circ$

$-125^\circ \quad -125^\circ$

$m^\circ = 55^\circ$ ✓

$n^\circ = 55^\circ$ (∠s Alternate to m°) ✓

17.) $85^\circ + z^\circ = 180^\circ$ (∠s Cointerior ∠s straight line)

$z^\circ = 95^\circ$ ✓

$y^\circ = 85^\circ$ (∠s opp ∠s of ||gram)

$x^\circ = 95^\circ$ (∠s coint. ∠s with z°) ✓

.) $50^\circ + 65^\circ + z^\circ = 180^\circ$ (∠ sum of △)

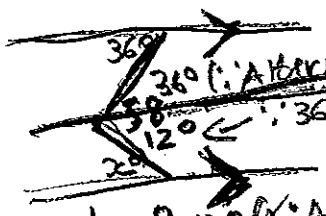
$-0 \quad -0 = 180$

6.) $b^\circ = 72^\circ$ (∵ vert opp ✓)
$x^\circ = 72^\circ$ (∵ corresponding to 72°) ✓

7.) $30^\circ + a^\circ = 100^\circ$ (∵ corresponding) ✓
$-30^\circ \quad -30^\circ$
$a^\circ = 70^\circ$ ✓

8.) $35^\circ + 35^\circ + p^\circ = 90^\circ$ (∵ right angle)
$70^\circ + p^\circ = 90^\circ$
$-70^\circ \quad -70^\circ$
$p^\circ = 20^\circ$ ✓

9.) $130^\circ + b^\circ = 180^\circ$ (∵ co-interior)
$\therefore b^\circ = 50^\circ$
$90^\circ + db^\circ = 180^\circ$ (∵ co-interior)
$db^\circ = 90^\circ$
Total $= 90^\circ + 50^\circ$
$b^\circ = 140^\circ$ ✓
$a^\circ = 140^\circ$ (∵ Alternate to 50° ✓)

10.)


$\therefore 36 + 22 = 58^\circ$
$\therefore x^\circ = 12^\circ$ (∵ Alternate)

11.) $a = 114^\circ$ (∵ corresponding angles)
straight line
$-114^\circ \quad -114^\circ$ (∵ ~~Angles at a point~~)
$b^\circ = 66$ ✓
$c^\circ = 114^\circ$ (∵ vert opp to a°)
$d^\circ = 66^\circ$ (∵ vert opp to b°)

13.) $x^\circ + x^\circ + x^\circ + x^\circ = 180^\circ$ (~~Let up~~ straight line)
$4x^\circ = 180^\circ$ ✓
$x^\circ = 45^\circ$ ✓

14.) $k^\circ + 90^\circ = 130^\circ$ (∵ vert opp + corr. ∠s)
$-90^\circ \quad -90^\circ$
$k^\circ = 40^\circ$ ✓

15.) $r^\circ = 30^\circ$ (∵ Vert opp to 30°) ✓

$s^\circ + 90^\circ + 30^\circ = 180^\circ$ (∵ straight line) ✓
$s^\circ + 120^\circ = 180^\circ$
$-120^\circ \quad -120^\circ$
$s^\circ = 60^\circ$ ✓

$t^\circ + 30^\circ = 180^\circ$ (∵ straight line) ✓
$-30^\circ \quad -30^\circ$
$t = 150^\circ$ ✓

16.) $35^\circ + m^\circ + 90^\circ = 180^\circ$ (∵ angle sum of tr ✓)
$125^\circ + m^\circ = 180^\circ$
$-125^\circ \quad -125^\circ$
$m^\circ = 55^\circ$ ✓

$n^\circ = 55^\circ$ (∵ Alter ✓ to m°)

17.) $85^\circ + z^\circ = 180^\circ$ (∵ ~~straight line~~ Cointerior ∠s)
$z^\circ = 95^\circ$ ✓
$y^\circ = 85^\circ$ (∵ ~~vert opp~~ opp ∠s of ||gram)
$x^\circ = 95^\circ$ (∵ ~~vert opp~~ z° coint. ∠s)

18.) $50^\circ + 65^\circ + z^\circ = 180^\circ$ (∠ sum of Δ)
$-115^\circ \quad -115^\circ$
$z^\circ = 65^\circ$ ✓
$y^\circ = 50^\circ$ (∵ ~~vert opp~~ Alt. ∠s)
$65^\circ + 50^\circ + x^\circ = 180^\circ$ (∵ ~~angles at a point~~ straight line)
$115^\circ + x^\circ = 180^\circ$
$x^\circ = 65^\circ$ ✓

19.) $p^\circ + p^\circ + p^\circ = 360^\circ$ (
$3p^\circ = 360^\circ$ ✓
$p^\circ = 120^\circ$ ✓

0.) $g^\circ = 100^\circ$ (corresponding angles)

$x^\circ + x^\circ + 100^\circ = 360^\circ$ ($\angle$ at a point)

$2x^\circ + 100 = 360$

$2x = 260$

$x = 130^\circ$