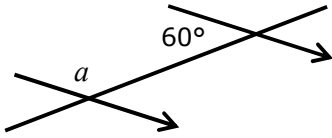## Basic Geometry #5 parallel lines, isosceles and polygons
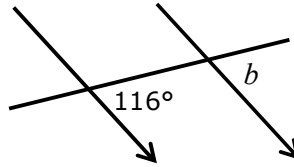
One Step Problems: Find the values of the unknown angles, giving the reason.
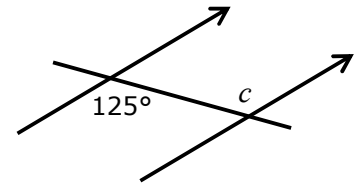
1.
60°
a

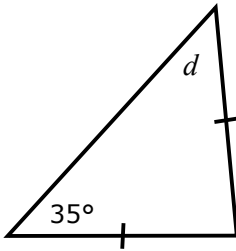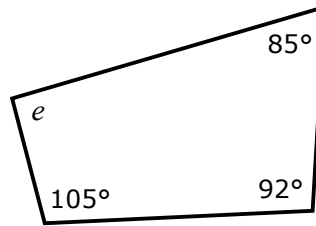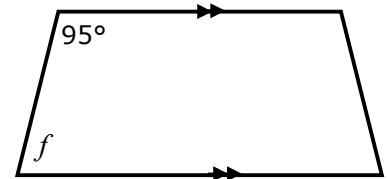2.
116°
b

3.
125°
c

4.
d
35°

5.
85°
e
105°
92°

6.
95°
f

7.
78°
g

8.
h
155°

9.
i
140°

10.
j
81°

11.
k
41°

12.
l
80°
80°
110°
110°
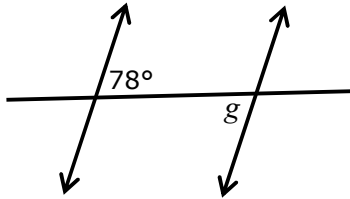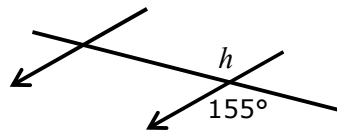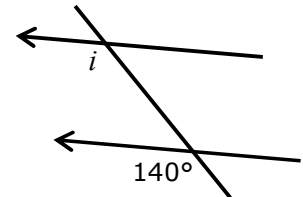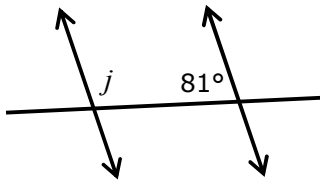
I
Harder Problems: Give the values of the unknown angles, giving **all** reasons.

13.
m
130°

14.
60°
84°
n

15.
regular octagon
o

16.
128°
p

17.
61°
q

18.
54°
r

19.
70°
s

20.
60°
t

MAN
VS
MATHS
2025
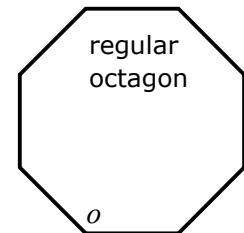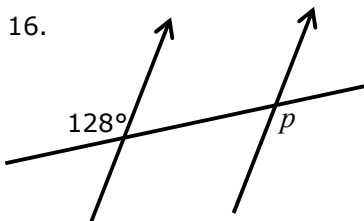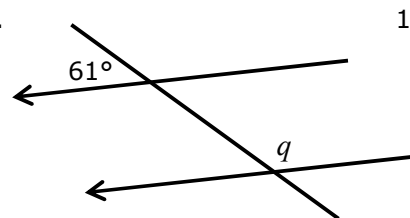
Answers : Basic Geometry #5 parallel lines, isosceles and polygons

1. $a = 180 - 60 =$ **120°**   Cointerior angles add to 180°

2. $b =$ **116°**   Corresponding angles are equal

3. $c =$ **125°**   Alternate angles are equal

4. $d =$ **35°**   Base angles isosceles triangles are equal
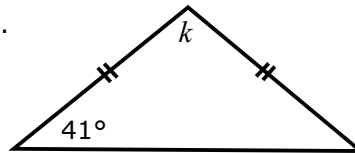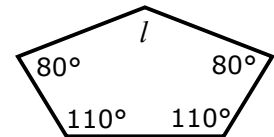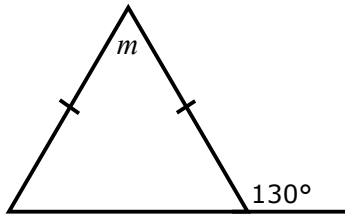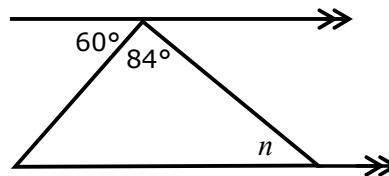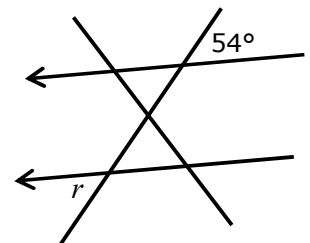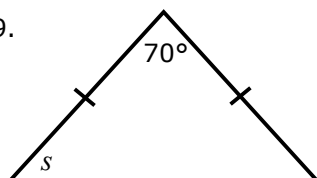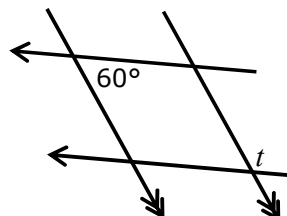
5. $e = 360 - 85 - 105 - 92 =$ **78°**   Interior angles of a quadrilateral add to 360°

6. $f = 180 - 95 =$ **85°**   Cointerior angles add to 180°

7. $g =$ **78°**   Alternate angles are equal

8. $h =$ **155°**   Vertically opposite angles are equal

9. $i =$ **140°**   Corresponding angles are equal

10. $j = 180 - 81 =$ **99°**   Cointerior angles add to 180°

11. $k = 180 - 41 - 41 =$ **98°**   Base angles isosceles and triangles add to 180°

12. $(5 - 2) \times 180 = 540$ Interior angles of a 5-sided polygon (pentagon)

    $l = 540 - 80 - 80 - 110 - 110 =$ **160°**

Note: Questions marked with an asterisk (*) can also be done with the steps in reverse order

13. base angle = 50°   Angles on a straight line add up to 180°

    $m = 180 - 50 - 50 =$ **67°**   Base angles isosceles and triangles add to 180°

14. Beside 84 = 180 – 84 – 60 = 36°   Angles on a straight line add up to 180°

    $n =$ **36°**   Alternate angles are equal *

15. $(8 - 2) \times 180 = 1080°$ Interior angles of a 8-sided polygon (octagon)

    $o = 1080 \div 8 =$ **145°**   Regular means all the interior angles are the same

16. angle across from p = 128°   Corresponding angles are equal

    $p =$ **128°**   Vertically opposite angles are equal *

17. Angle beside q = 61°   Corresponding angles are equal

    $q = 180 - 61 =$ **119°**   Angles on a straight line add to 180° *

    or vertically opposite then cointerior * or on a line add 180° then alternate *

18. Diagonally to bottom left = 54°   Corresponding angles are equal

    $r =$ **54°**   Vertically opposite angles are equal *

19. Other angle = s Base angles isosceles are equal

    55 + 55 + 70 = 180°, so $s =$ **55°**   Interior angles of a triangle add to 180°

20. Across to parallel line = 60°   Corresponding angles are equal

t = 180 − 60 = **120°**   Cointerior angles add to 180° *