Basic Geometry #6 parallel lines, isosceles and polygons

One Step Problems: Find the values of the unknown angles, giving the reason.

1.

78°

a

2.

100°   b

87°   68°

3.

97°   c

4.

121°   d

5.

e
63°

6.

f
42°

7.

94°

g

8.

100°   125°
97°
95°
h   150°

9.

i

124°

10.

j
82°

11.

155°
k

12.

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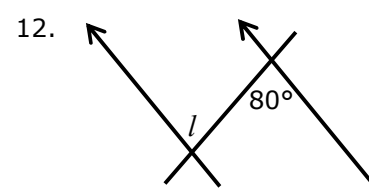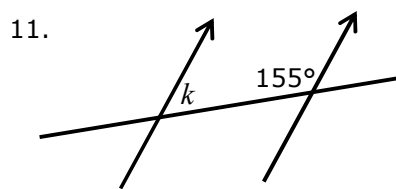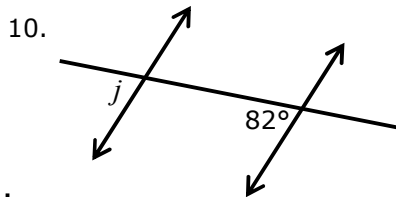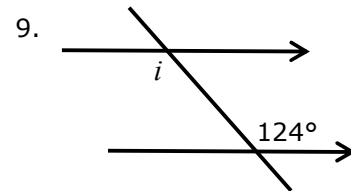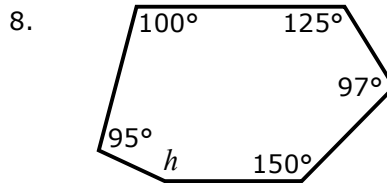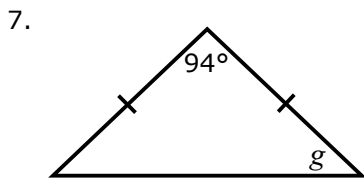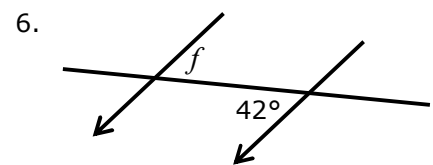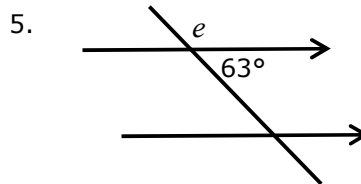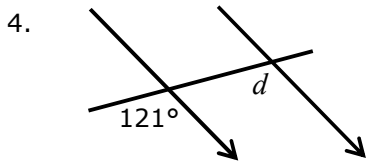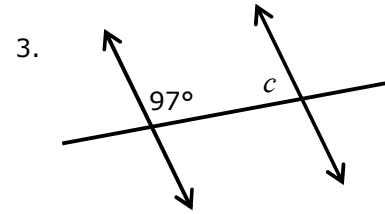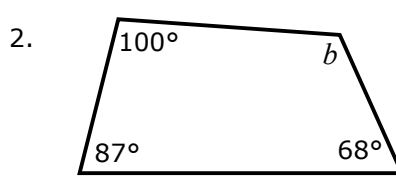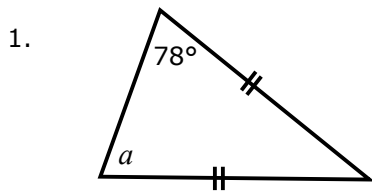
Harder Problems: Give the values of the unknown angles, giving **all** reasons.

13.

122°
m

14.

n
40°
68°

15.

o
50°

16.

112°
p

17.

q

regular
decagon

18.

30°
r
54°
25°

19.

74°
45°
s

20.

t
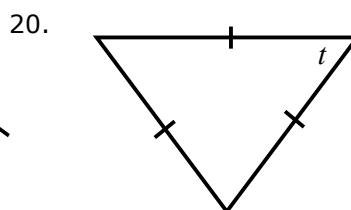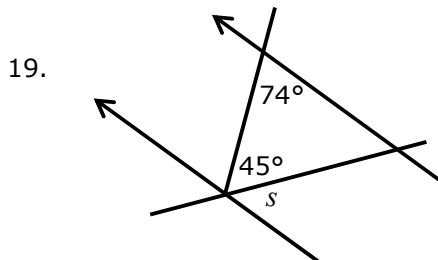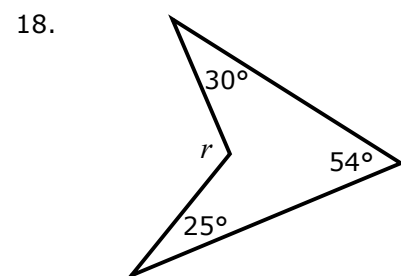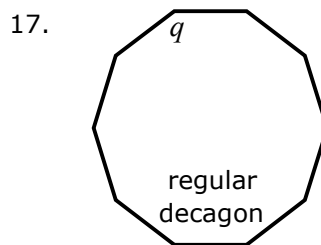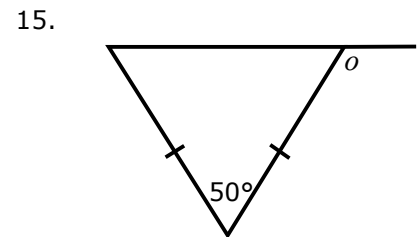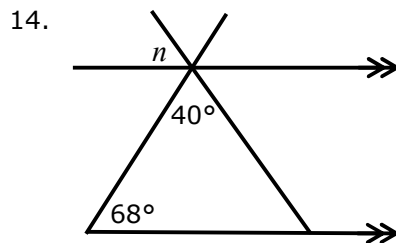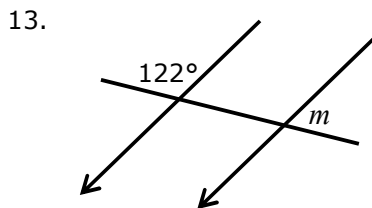
Answers : Basic Geometry #6 parallel lines, isosceles and polygons

1. a = **78°**   Base angles isosceles triangles are equal

2. b = 360 – 100 – 87 – 68 = **105°**   Interior angles of a quadrilateral add to 360°

3. c = 180 – 97 = **83°**   Cointerior angles add to 180°

4. d = **121°**   Corresponding angles are equal

5. e = 180 – 63 = **117°**   Angles on a straight line add up to 180°

6. f = **42°**   Alternate angles are equal

7. g = **43°** (43 + 43 + 94 = 180)   Base angles isosceles and triangles add to 180°

8. (6 – 2) × 180 = 720   Interior angles of a 6-sided polygon (hexagon)
    h = 720 – 95 – 100 – 125 – 97 – 150 = **153°**

9. i = **124°**   Alternate angles are equal
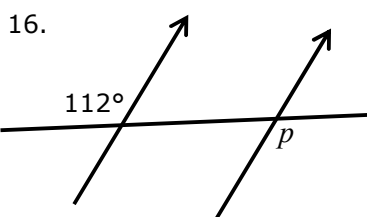
10. j = **82°**   Corresponding angles are equal

11. k =180 – 155 = **25°**   Cointerior angles add to 180°

12. l = **80°**   Alternate angles are equal

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

13. angle beside m = 122°   Corresponding angles are equal
    m = 180 – 122 = **58°**   Angles on a straight line add up to 180° *

14. angle between 40 and n is 68°   Alternate angles are equal
    n = 180 – 40 – 68 = **72°**   Angles on a straight line add up to 180°

15. 65 + 65 + 50 = 180   Base angles isosceles are equal and triangle
    o = 180 – 65 = **115°**   Angles on a straight line add up to 180°

16. angle across from p = 112°   Corresponding angles are equal
    p = **112°**   Vertically opposite angles are equal *

17. (10 – 2) × 180 = 1440°   Interior angles of a 10-sided polygon (decagon)
    q = 1440 ÷ 10 = **144°**   Regular means all the interior angles are the same

18. Opposite r = 360 – 54 – 30 – 25 = 251°   Interior angles of quadrilaterals add to 360°
    r = 360 – 251 = **109°**   Angles at a point add to 360°

19. angle beside 45 is 74°   Alternate angles are equal
    n = 180 – 45 – 74 = **61°**   Angles on a straight line add up to 180°
    or third angle in triangle is 61 as add to 180°, then alternate angles are equal

20. t = **60°**   All three angles are equal and add to 180°