QUESTION 1 Complete the following sentences.

a The size of an acute angle is always less than 90°.

b The size of a right angle is always equal to 90°.

c The size of an obtuse angle is always between 90° and 180°.

d Complementary angles add up to 90°.

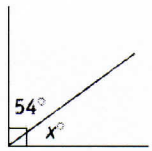
e Supplementary angles add up to 180°.

f Vertically opposite angles are always equal.

g Angles around a point add up to 360°.

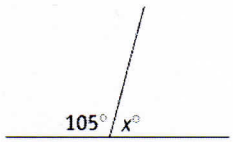
QUESTION 1 Find the value of the pronumeral in each of the following.

a



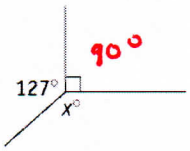
$54 + x = 90$
$\therefore x = 90 - 54 = 36°$

b



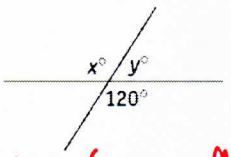
$105 + x = 180$
$\therefore x = 75°$

c



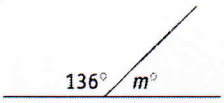
$127 + 90 + x = 360$
$\therefore x = 143°$

d



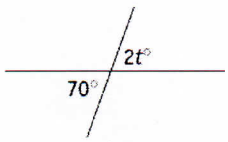
$x = 120$ (vertically opposite)
$x + y = 180$ $\therefore y = 60°$

e



$136 + m = 180$
$\therefore m = 44°$

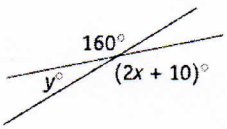
f



$2t = 70$ $\therefore$
$t = 35°$

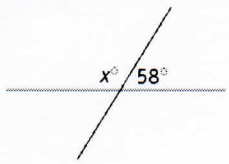
QUESTION 2 Find the value of the pronumeral and give reasons to justify your answer.

a



$y + 160 = 180$ $\therefore y = 20°$
$2x + 10 = 160$ $\therefore x = 75$

b

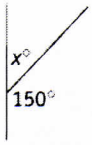


$x + 58 = 180$
$\therefore x = 122°$

c

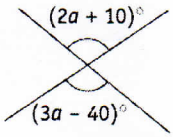
$40 + 90 + x = 180$
$\therefore x = 50°$

d



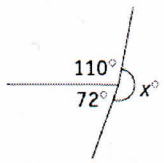
$x + 150 = 180$
$\therefore x = 30°$

e



$2a + 10 = 3a - 40$
$\therefore a = 10 + 40$
$a = 50$

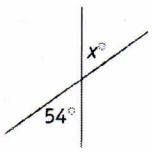
f



$110 + 72 + x = 360$
$\therefore x = 178°$

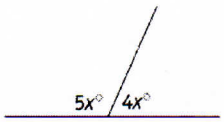
QUESTION 3 Find the value of the pronumeral, giving reasons.

a



$x = 54$ (vertically opposite angles are equal)

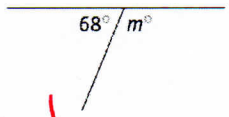
b



$5x + 4x = 180$ (supplementary)

so $9x = 180$ $x = 20°$

c



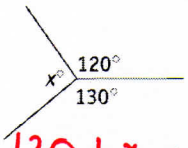
$68 + m = 180$

so $m = 112°$

(supplementary angles)

QUESTION 1 Find the value of the pronumeral in each of the following.

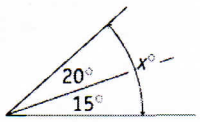
a



$120 + 130 + x = 360$

so $x = 110°$

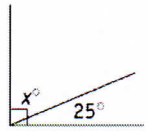
b



$x = 20 + 15$

$x = 35°$

c



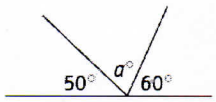
$x + 25 = 90$

(complementary angles)

so $x = 65°$

QUESTION 3 Find the value of the pronumeral, giving reasons.

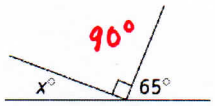
a



$50 + a + 60 = 180$

so $a = 70°$

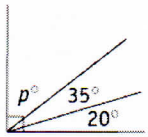
b



$x + 90 + 65 = 180$

so $x = 25°$

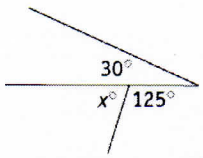
c



$p + 35 + 20 = 90$

so $p = 35°$

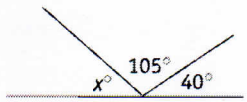
d



$x + 125 = 180$

so $x = 55°$

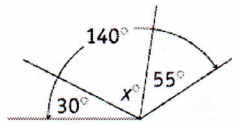
e



$x + 105 + 40 = 180$

so $x = 35°$

f



$140 = 30 + x + 55$

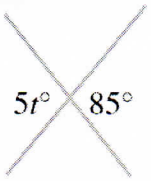
so $x = 55°$

8 Form an equation and solve it to find the value of each pronumeral. Give brief reasons.

a

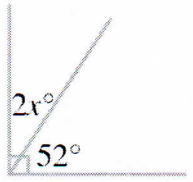
$3m + 111 = 180$
(supplementary angles)
so $3m = 69$
$\therefore m = 23$

b



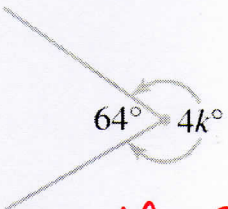
$5t = 85$
(vertically opposite angles are equal)
so $t = 17$

c



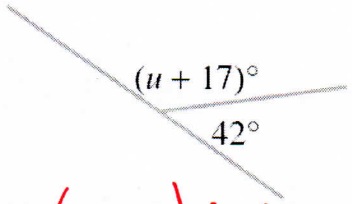
$2x + 52 = 90$
(complementary angles)
so $2x = 38$ $\therefore x = 19°$

d



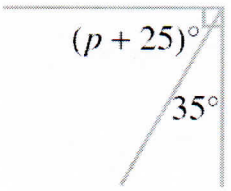
$64 + 4k = 360$
(revolution)
so $4k = 296$
$\therefore k = 74$

e



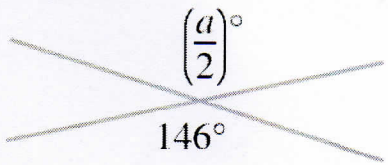
$(u + 17) + 42 = 180$
(supplementary angles)
so $u = 121°$

f



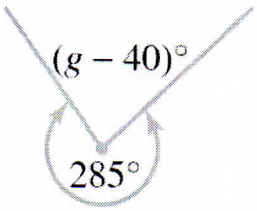
$p + 25 + 35 = 90$
$p = 30°$

g



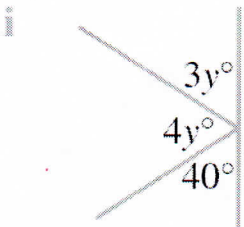
$\frac{a}{2} = 146$
so $a = 292$

h



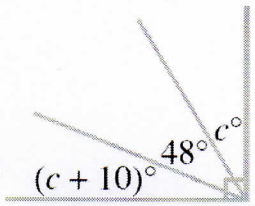
$g - 40 + 285 = 360$
$g = 115$

i



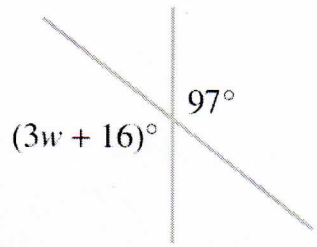
$3y + 4y + 40 = 180$
so $7y = 140$ $y = 20$

j



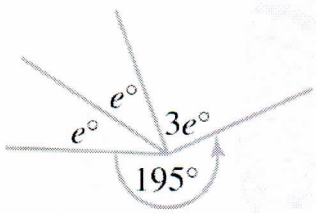
$c + 10 + 48 + c = 90$
$2c + 58 = 90$
$2c = 32$
so $c = 16$

k



$3w + 16 = 97$
(vertically opposite angles)
so $3w = 81$
$w = 27$

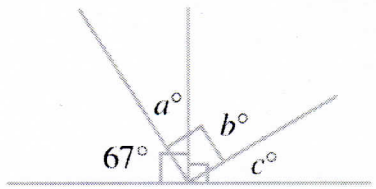
l



$e + e + 3e + 195 = 360$
$5e + 195 = 360$
$5e = 165$
so $e = 33°$

9 Find the value of each pronumeral, giving reasons.

a



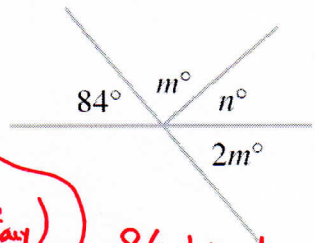
$67 + a = 90$ (complementary)

$\therefore a = 23°$

$a + b = 90$ $\therefore b = 67$

$b + c = 90$ $\therefore c = 23$

b



$84 + m + n = 180$ ①

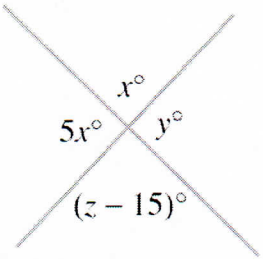
and $3m + n = 180$ ②

$\therefore$ ① − ② gives

$84 - 2m = 0$ $\therefore m = 42$

and from ①, $n = 54$

c



$5x + x = 180$

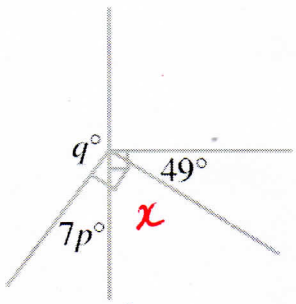
$\therefore 6x = 180$ $x = 30°$

$x + y = 180$ $\therefore y = 150°$

$x = z - 15$

$\therefore z = 45°$

d



$x + 49 = 90$ $\therefore x = 41°$

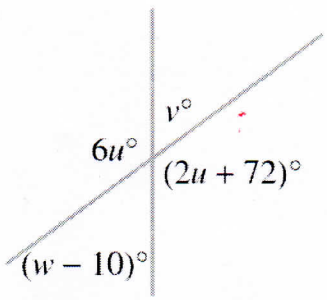
$7p + x = 90$ $\therefore 7p = 49$

$\therefore p = 7$

$7p + q = 180$ $\therefore 49 + q = 180$

$q = 131°$

e



$6u = 2u + 72$

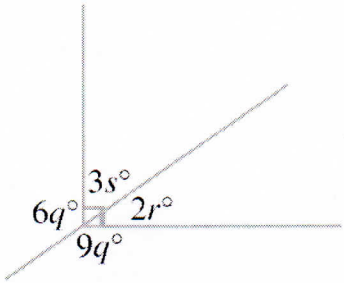
$\therefore 4u = 72$ $u = 18°$

$6u + v = 180$ $\therefore 108 + v = 180$

$v = 72°$

$6u + w - 10 = 180$ $\therefore w = 82°$

f



$3s + 2r = 90$

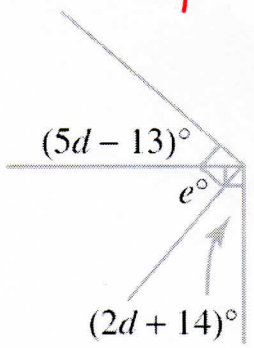
$6q + 9q = 270$

$\therefore q = 18$

$2r + 9q = 180$ $\therefore r = 9$

$3s + 2r = 90$ $\therefore s = 24$

g



$5d - 13 + e = 90$ ①

$2d + 14 + e = 90$ ②

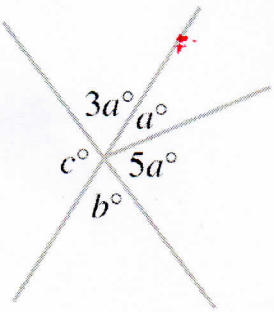
① − ② $\Rightarrow$ $3d - 27 = 0$

$\therefore d = 9$

from ① $45 - 13 + e = 90$

$\therefore e = 58°$

h



$3a + a + 5a = 180$

$\therefore 9a = 180$ $a = 20°$

then $3a + c = 180$

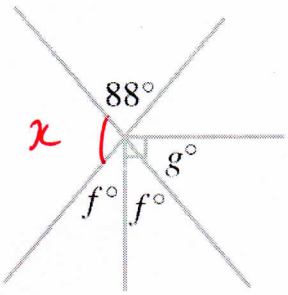
$\therefore c = 180 - 3a$

$c = 120°$

and $b + c = 180$

$\therefore b = 60°$

i



$88 + x = 180$

$\therefore x = 92$

$x + 2f = 180$

$\therefore 92 + 2f = 180$

$f = 44°$

$f + g = 90$

$\therefore g = 56°$