G.CO.C.10: Isosceles Triangle Theorem 1
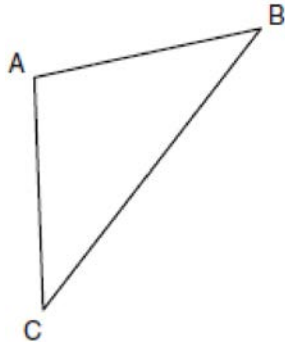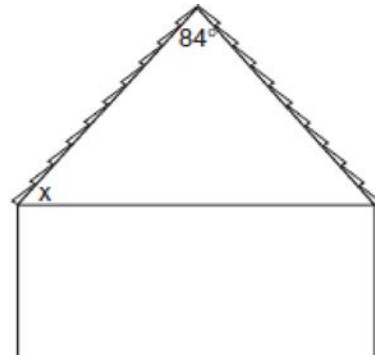
1 In the diagram of $\triangle ABC$ below, $\overline{AB} \cong \overline{AC}$. The measure of $\angle B$ is 40°.

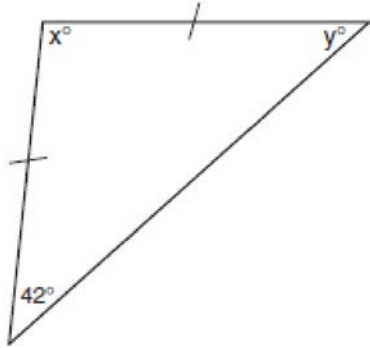What is the measure of $\angle A$?
1) 40°
2) 50°
3) 70°
4) 100°

2 The accompanying diagram shows the roof of a house that is in the shape of an isosceles triangle. The vertex angle formed at the peak of the roof is 84°.

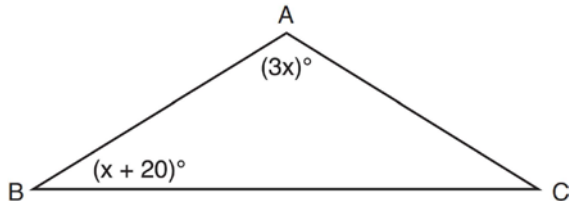What is the measure of x?
1) 138°
2) 96°
3) 84°
4) 48°

3 Tina wants to sew a piece of fabric into a scarf in the shape of an isosceles triangle, as shown in the accompanying diagram.

What are the values of x and y?
1) $x = 42$ and $y = 96$
2) $x = 69$ and $y = 69$
3) $x = 90$ and $y = 48$
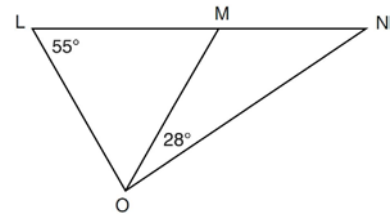4) $x = 96$ and $y = 42$

4 In the diagram below of $\triangle ABC$, $\overline{AB} \cong \overline{AC}$, $m\angle A = 3x$, and $m\angle B = x + 20$.
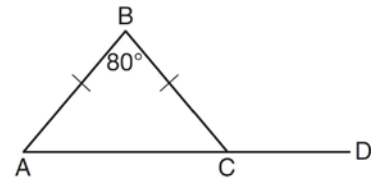

What is the value of x?
1) 10
2) 28
3) 32
4) 40

5 In the diagram below, $\triangle LMO$ is isosceles with $LO = MO$.

If $m\angle L = 55$ and $m\angle NOM = 28$, what is $m\angle N$?
1) 27
2) 28
3) 42
4) 70

6 In the diagram below of isosceles $\triangle ABC$, the measure of vertex angle B is 80°. If $\overline{AC}$ extends to point D, what is $m\angle BCD$?

1) 50
2) 80
3) 100
4) 130
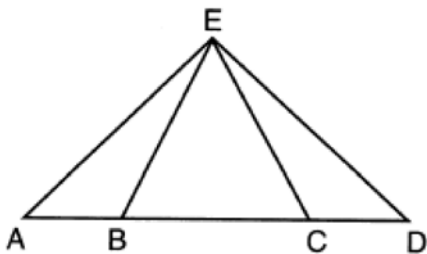
7 In $\triangle JKL$, $\overline{JL} \cong \overline{KL}$. If $m\angle J = 58$, then $m\angle L$ is
1) 61
2) 64
3) 116
4) 122

2

8 In $\triangle FGH$, $m\angle F = m\angle H$, $GF = x + 40$,
   $HF = 3x - 20$, and $GH = 2x + 20$. The length of
   $\overline{GH}$ is
   1) 20
   2) 40
   3) 60
   4) 80

9 The vertex angle of an isosceles triangle measures
   15 degrees more than one of its base angles. How
   many degrees are there in a base angle of the
   triangle?
   1) 50
   2) 55
   3) 65
   4) 70

10 In the diagram below of $\triangle AED$ and $\overline{ABCD}$,
    $\overline{AE} \cong \overline{DE}$.

   Which statement is always true?
   1) $\overline{EB} \cong \overline{EC}$
   2) $\overline{AC} \cong \overline{DB}$
   3) $\angle EBA \cong \angle ECD$
   4) $\angle EAC \cong \angle EDB$

11 In $\triangle ABC$, $\overline{AB} \cong \overline{BC}$. An altitude is drawn from B
    to $\overline{AC}$ and intersects $\overline{AC}$ at D. Which conclusion is
    not always true?
    1) $\angle ABD \cong \angle CBD$
    2) $\angle BDA \cong \angle BDC$
    3) $\overline{AD} \cong \overline{BD}$
    4) $\overline{AD} \cong \overline{DC}$

12 In isosceles triangle ABC, $AB = BC$. Which
    statement will always be true?
    1) $m\angle B = m\angle A$
    2) $m\angle A > m\angle B$
    3) $m\angle A = m\angle C$
    4) $m\angle C < m\angle B$

13 If the vertex angles of two isosceles triangles are
    congruent, then the triangles must be
    1) acute
    2) congruent
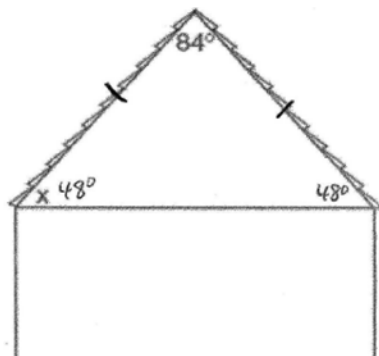   3) right
    4) similar

14 In isosceles triangle DOG, the measure of the
    vertex angle is three times the measure of one of
    the base angles. Which statement about $\triangle DOG$ is
    true?
    1) $\triangle DOG$ is a scalene triangle.
    2) $\triangle DOG$ is an acute triangle.
    3) $\triangle DOG$ is a right triangle.
    4) $\triangle DOG$ is a obtuse triangle.

G.CO.C.10: Isosceles Triangle Theorem 1
Answer Section
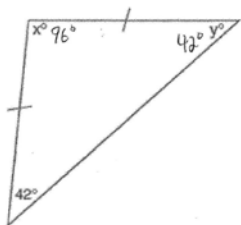
1 ANS: 4
   $180 - (40 + 40) = 100$

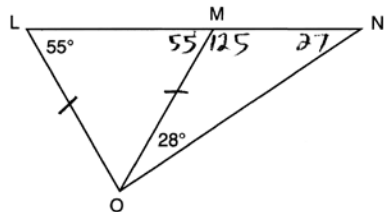   REF: 080903ge
2 ANS: 4

   REF: 060615a
3 ANS: 4

   REF: 060510a
4 ANS: 2
   $3x + x + 20 + x + 20 = 180$

$$5x = 40$$

$$x = 28$$

   REF: 081222ge
5 ANS: 1

   REF: 061211ge

1

6   ANS: 4

$$180 - \frac{180 - 80}{2} = 130$$

REF: 011508ge

7   ANS: 2

$180 - 2(58) = 64$

REF: 081510ge

8   ANS: 3

$x + 40 = 2x + 20 \quad GH = 2(20) + 20 = 60$

$20 = x$

REF: 081416ge

9   ANS: 2

$x + x + x + 15 = 180$

$3x + 15 = 180$

$3x = 165$

$x = 15$

REF: 061407ge

10   ANS: 4

Isosceles triangle theorem.

REF: 062207geo

11   ANS: 3   REF: 011007ge
12   ANS: 3   REF: 061004ge
13   ANS: 4   REF: 061124ge
14   ANS: 4

$A = 3x \quad 3x + x + x = 180$

$B = x \quad 5x = 180$ The vertex angle is $3(36) = 108°$.

$C = x \quad x = 36$

REF: 060107a