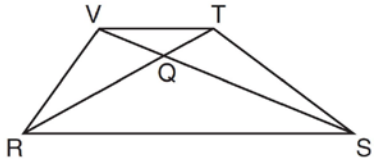
Name: _____

G.CO.C.11: Trapezoids 1a

1 If the diagonals of a quadrilateral do *not* bisect each other, then the quadrilateral could be a
1) rectangle 2) rhombus 3) square
4) trapezoid

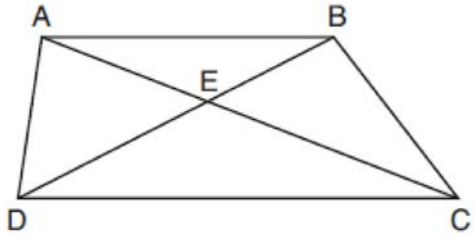
2 In trapezoid $RSTV$ with bases $\overline{RS}$ and $\overline{VT}$, diagonals $\overline{RT}$ and $\overline{SV}$ intersect at Q.



If trapezoid $RSTV$ is *not* isosceles, which triangle is equal in area to $\triangle RSV$?
1) $\triangle RQV$ 2) $\triangle RST$ 3) $\triangle RVT$ 4) $\triangle SVT$

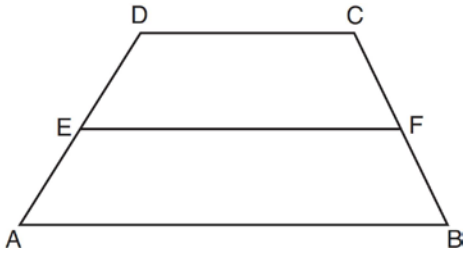
3 Isosceles trapezoid $ABCD$ has diagonals $\overline{AC}$ and $\overline{BD}$. If $AC = 5x + 13$ and $BD = 11x - 5$, what is the value of x?
1) 28 2) $10\frac{3}{4}$ 3) 3 4) $\frac{1}{2}$

4 In trapezoid $ABCD$ below, $\overline{AB} \parallel \overline{CD}$.



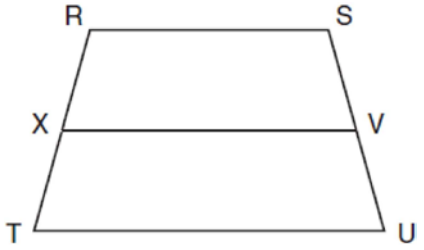
If $AE = 5.2$, $AC = 11.7$, and $CD = 10.5$, what is the length of $\overline{AB}$, to the *nearest tenth*?
1) 4.7 2) 6.5 3) 8.4 4) 13.1

5 In the diagram below, $\overline{EF}$ is the median of trapezoid $ABCD$.



If $AB = 5x - 9$, $DC = x + 3$, and $EF = 2x + 2$, what is the value of x?
1) 5 2) 2 3) 7 4) 8

6 In the diagram below of trapezoid $RSUT$, $\overline{RS} \parallel \overline{TU}$, X is the midpoint of $\overline{RT}$, and V is the midpoint of $\overline{SU}$.



If $RS = 30$ and $XV = 44$, what is the length of $\overline{TU}$?
1) 37 2) 58 3) 74 4) 118

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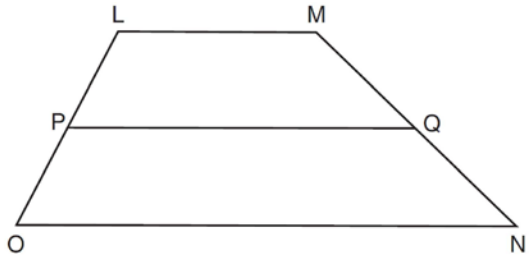
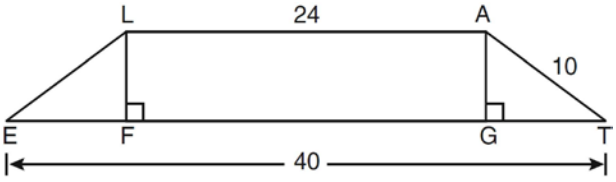
7 In trapezoid $LMNO$ below, median $\overline{PQ}$ is drawn.



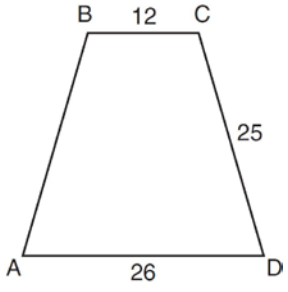
If $LM = x + 7$, $ON = 3x + 11$, and $PQ = 25$, what is the value of x?
1) 1.75 2) 3.5 3) 8 4) 17

8 In the diagram below, $LATE$ is an isosceles trapezoid with $\overline{LE} \cong \overline{AT}$, $LA = 24$, $ET = 40$, and $AT = 10$. Altitudes $\overline{LF}$ and $\overline{AG}$ are drawn.



What is the length of $\overline{LF}$?
1) 6 2) 8 3) 3 4) 4

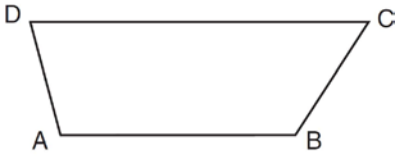
9 In the diagram below of isosceles trapezoid $ABCD$, $AB = CD = 25$, $AD = 26$, and $BC = 12$.



What is the length of an altitude of the trapezoid?
1) 7 2) 14 3) 19 4) 24

10 In isosceles trapezoid $ABCD$, $\overline{AB} \cong \overline{CD}$. If $BC = 20$, $AD = 36$, and $AB = 17$, what is the length of the altitude of the trapezoid?
1) 10 2) 12 3) 15 4) 16

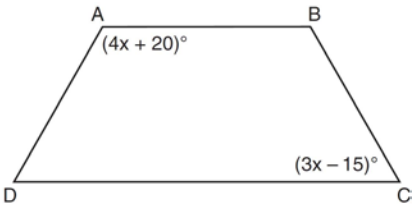
11 In the diagram below, $\overline{AB}$ and $\overline{CD}$ are bases of trapezoid $ABCD$.



(Not drawn to scale)

If $m\angle B = 123$ and $m\angle D = 75$, what is $m\angle C$?
1) 57 2) 75 3) 105 4) 123

12 In the diagram of trapezoid $ABCD$ below, $\overline{AB} \parallel \overline{DC}$, $\overline{AD} \cong \overline{BC}$, $m\angle A = 4x + 20$, and $m\angle C = 3x - 15$.



What is $m\angle D$?
1) 25 2) 35 3) 60 4) 90

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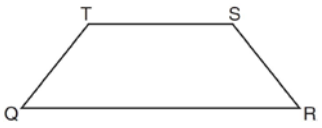
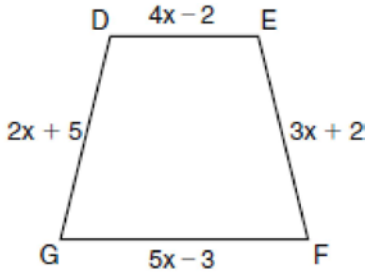
13 In isosceles trapezoid $QRST$ shown below, $\overline{QR}$ and $\overline{TS}$ are bases.



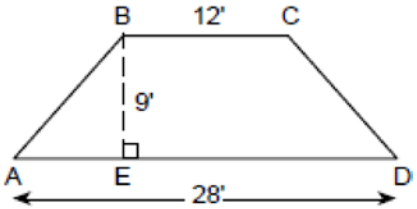
If $m\angle Q = 5x + 3$ and $m\angle R = 7x - 15$, what is $m\angle Q$?

1) 83 2) 48 3) 16 4) 9

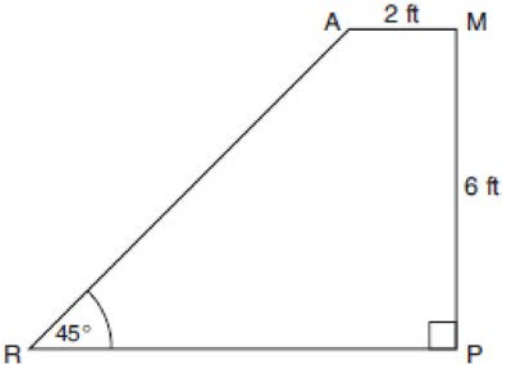
14 In the diagram below of isosceles trapezoid $DEFG$, $\overline{DE} \parallel \overline{GF}$, $DE = 4x - 2$, $EF = 3x + 2$, $FG = 5x - 3$, and $GD = 2x + 5$. Find the value of x.



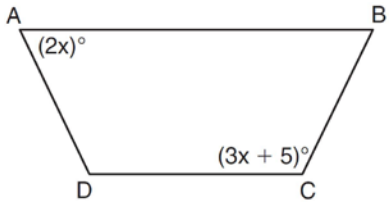
15 The cross section of an attic is in the shape of an isosceles trapezoid, as shown in the accompanying figure. If the height of the attic is 9 feet, $BC = 12$ feet, and $AD = 28$ feet, find the length of $\overline{AB}$ to the *nearest foot*.



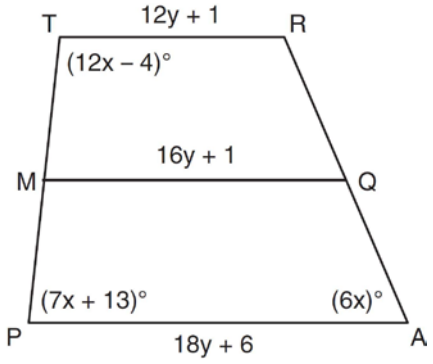
16 The accompanying diagram shows ramp $\overline{RA}$ leading to level platform $\overline{AM}$, forming an angle of 45° with level ground. If platform $\overline{AM}$ measures 2 feet and is 6 feet above the ground, explain why the exact length of ramp $\overline{RA}$ is $6\sqrt{2}$ feet.



17 The diagram below shows isosceles trapezoid $ABCD$ with $\overline{AB} \parallel \overline{DC}$ and $\overline{AD} \cong \overline{BC}$. If $m\angle BAD = 2x$ and $m\angle BCD = 3x + 5$, find $m\angle BAD$.



18 Trapezoid $TRAP$, with median $\overline{MQ}$, is shown in the diagram below. Solve algebraically for x and y.



G.CO.C.11: Trapezoids 1a
Answer Section

1 ANS: 4 REF: 061008ge

2 ANS: 2

Isosceles or not, $\triangle RSV$ and $\triangle RST$ have a common base, and since $\overline{RS}$ and $\overline{VT}$ are bases, congruent altitudes.

REF: 061301ge

3 ANS: 3

The diagonals of an isosceles trapezoid are congruent. $5x + 3 = 11x - 5.$

$$6x = 18$$
$$x = 3$$

REF: fall0801ge

4 ANS: 3

$$\frac{6.5}{10.5} = \frac{5.2}{x}$$
$$x = 8.4$$

REF: 012006geo

5 ANS: 1

The length of the midsegment of a trapezoid is the average of the lengths of its bases. $\frac{x + 3 + 5x - 9}{2} = 2x + 2.$

$$6x - 6 = 4x + 4$$
$$2x = 10$$
$$x = 5$$

REF: 081221ge

6 ANS: 2

The length of the midsegment of a trapezoid is the average of the lengths of its bases. $\frac{x + 30}{2} = 44.$

$$x + 30 = 88$$
$$x = 58$$

REF: 011001ge

7 ANS: 3

$$\frac{x+7+3x+11}{2} = 25$$

$$4x + 18 = 50$$

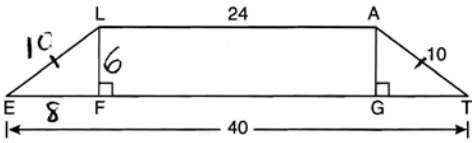
$$4x = 32$$

$$x = 8$$

REF: 011608ge

8 ANS: 1

$\frac{40-24}{2} = 8.$ $\sqrt{10^2 - 8^2} = 6.$



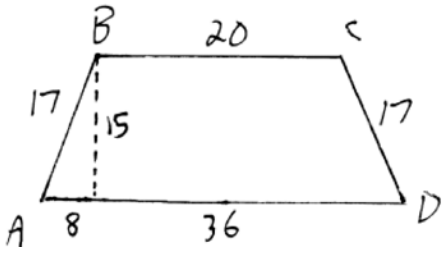
REF: 061204ge

9 ANS: 4

$$\sqrt{25^2 - \left(\frac{26-12}{2}\right)^2} = 24$$

REF: 011219ge

10 ANS: 3



$\frac{36-20}{2} = 8.$ $\sqrt{17^2 - 8^2} = 15$

REF: 061016ge

11 ANS: 1

$180 - 123 = 57$

REF: 061419ge

12 ANS: 3

$2(4x + 20) + 2(3x - 15) = 360.$ $\angle D = 3(25) - 15 = 60$

$$8x + 40 + 6x - 30 = 360$$

$$14x + 10 = 360$$

$$14x = 350$$

$$x = 25$$

REF: 011321ge

13 ANS: 2

$5x + 3 = 7x - 15 \quad 5(9) + 3 = 48$

$18 = 2x$

$9 = x$

REF: 011515ge

14 ANS:

3. The non-parallel sides of an isosceles trapezoid are congruent. $2x + 5 = 3x + 2$

$x = 3$

REF: 080929ge

15 ANS:

12. Because the shape is an isosceles trapezoid, $\overline{AE} = \frac{28 - 12}{2} = 8$. Using Pythagoras, $8^2 + 9^2 = c^2$

$c \approx 12$

REF: 069933a

16 ANS:

Draw a line perpendicular to $\overline{RP}$ at T to A. $\triangle RAT$ is an isosceles right triangle with legs of 6. $6^2 + 6^2 = c^2$

$72 = c^2$

$\sqrt{72} = c$

$6\sqrt{2} = c$

REF: 080726b

17 ANS:

70. $3x + 5 + 3x + 5 + 2x + 2x = 180$

$10x + 10 = 360$

$10x = 350$

$x = 35$

$2x = 70$

REF: 081029ge

18 ANS:

$12x - 4 + 7x + 13 = 180$. $16y + 1 = \frac{12y + 1 + 18y + 6}{2}$

$19x + 9 = 180$ $32y + 2 = 30y + 7$

$19x = 171$ $2y = 5$

$x = 9$ $y = \frac{5}{2}$

REF: 081337ge