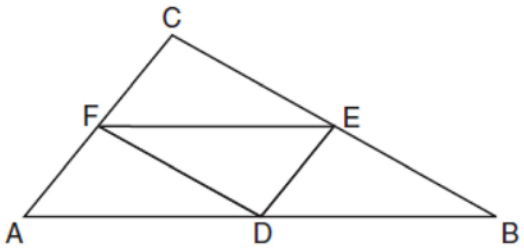
Name: _____

G.CO.C.10: Midsegments

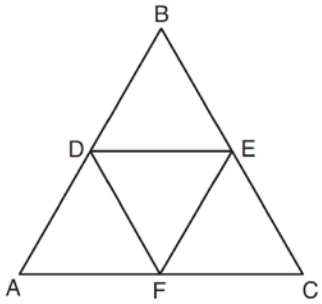
1 In the diagram below of $\triangle ABC$, D, E, and F are the midpoints of $\overline{AB}$, $\overline{BC}$, and $\overline{CA}$, respectively.



What is the ratio of the area of $\triangle CFE$ to the area of $\triangle CAB$?

1) 1:1
2) 1:2
3) 1:3
4) 1:4

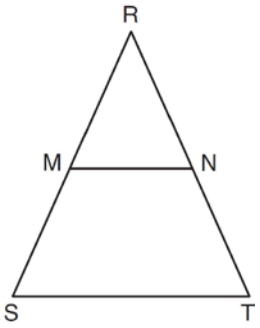
2 In the diagram below, the vertices of $\triangle DEF$ are the midpoints of the sides of equilateral triangle ABC, and the perimeter of $\triangle ABC$ is 36 cm.



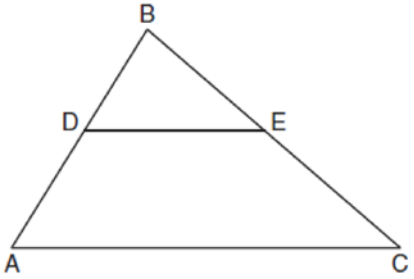
What is the length, in centimeters, of $\overline{EF}$?

1) 6
2) 12
3) 18
4) 4

3 In isosceles triangle RST shown below, $\overline{RS} \cong \overline{RT}$, M and N are midpoints of $\overline{RS}$ and $\overline{RT}$, respectively, and $\overline{MN}$ is drawn. If $MN = 3.5$ and the perimeter of $\triangle RST$ is 25, determine and state the length of $\overline{NT}$.

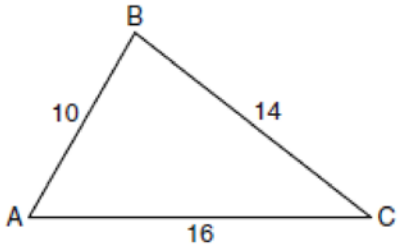


4 In the diagram below of $\triangle ABC$, $\overline{DE}$ is a midsegment of $\triangle ABC$, $DE = 7$, $AB = 10$, and $BC = 13$. Find the perimeter of $\triangle ABC$.

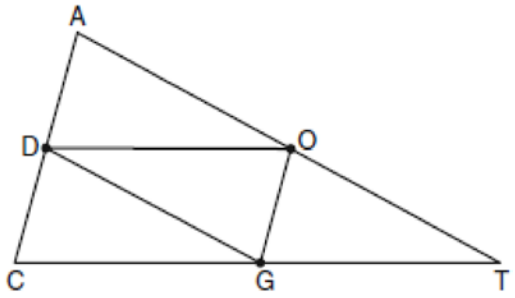


Name: _____

5 In the diagram of $\triangle ABC$ below, $AB = 10$, $BC = 14$, and $AC = 16$. Find the perimeter of the triangle formed by connecting the midpoints of the sides of $\triangle ABC$.



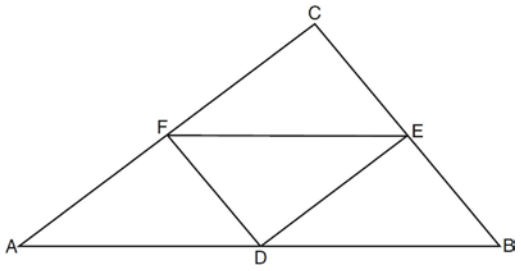
6 In the diagram below of $\triangle ACT$, D is the midpoint of $\overline{AC}$, O is the midpoint of $\overline{AT}$, and G is the midpoint of $\overline{CT}$.



If $AC = 10$, $AT = 18$, and $CT = 22$, what is the perimeter of parallelogram $CDOG$?

1) 21
2) 25
3) 32
4) 40

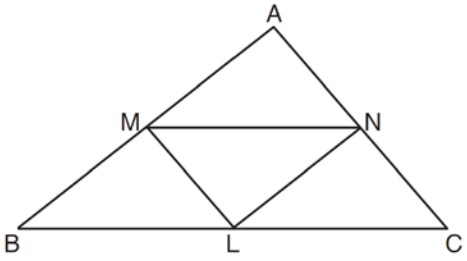
7 In the diagram of $\triangle ABC$ shown below, D is the midpoint of $\overline{AB}$, E is the midpoint of $\overline{BC}$, and F is the midpoint of $\overline{AC}$.



If $AB = 20$, $BC = 12$, and $AC = 16$, what is the perimeter of trapezoid $ABEF$?

1) 24
2) 36
3) 40
4) 44

8 In $\triangle ABC$ shown below, L is the midpoint of $\overline{BC}$, M is the midpoint of $\overline{AB}$, and N is the midpoint of $\overline{AC}$.

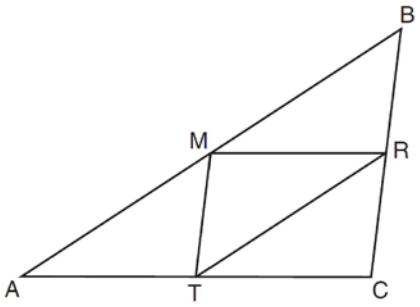


If $MN = 8$, $ML = 5$, and $NL = 6$, the perimeter of trapezoid $BMNC$ is

1) 35
2) 31
3) 28
4) 26

Name: _____

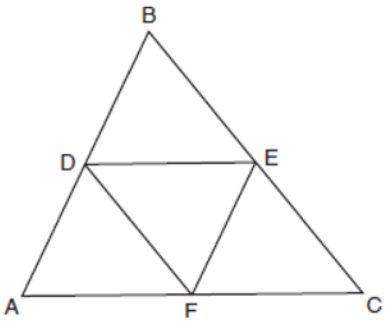
9 As shown in the diagram below, M, R, and T are midpoints of the sides of $\triangle ABC$.



If $AB = 18$, $AC = 14$, and $BC = 10$, what is the perimeter of quadrilateral $ACRM$?

1) 35
2) 32
3) 24
4) 21

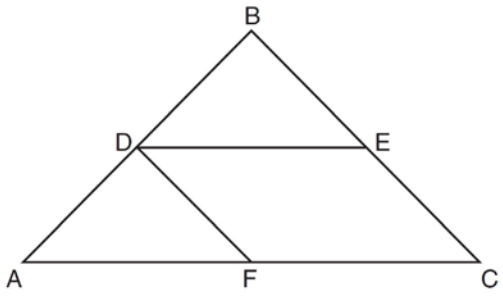
10 In the diagram below, $\overline{DE}$, $\overline{DF}$, and $\overline{EF}$ are midsegments of $\triangle ABC$.



The perimeter of quadrilateral $ADEF$ is equivalent to

1) $AB + BC + AC$
2) $\frac{1}{2}AB + \frac{1}{2}AC$
3) $2AB + 2AC$
4) $AB + AC$

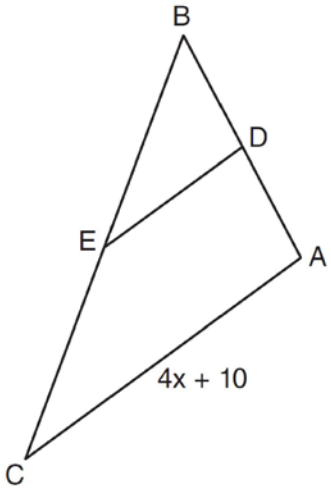
11 In the diagram below of $\triangle ABC$, $\overline{DE}$ and $\overline{DF}$ are midsegments.



(Not drawn to scale)

If $DE = 9$, and $BC = 17$, determine and state the perimeter of quadrilateral $FDEC$.

12 In the diagram below of $\triangle ABC$, D is the midpoint of $\overline{AB}$, and E is the midpoint of $\overline{BC}$.

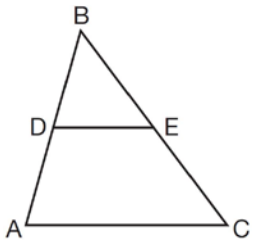


If $AC = 4x + 10$, which expression represents DE?

1) $x + 2.5$
2) $2x + 5$
3) $2x + 10$
4) $8x + 20$

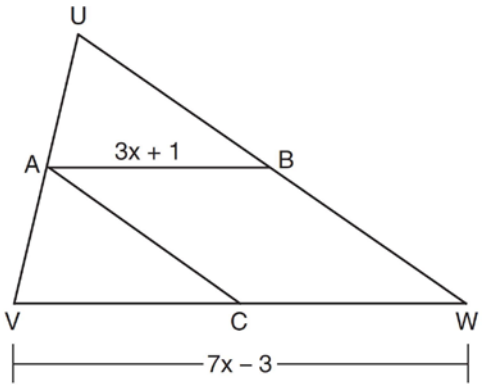
Name: _____

13 In $\triangle ABC$, D is the midpoint of $\overline{AB}$ and E is the midpoint of $\overline{BC}$. If $AC = 3x - 15$ and $DE = 6$, what is the value of x?



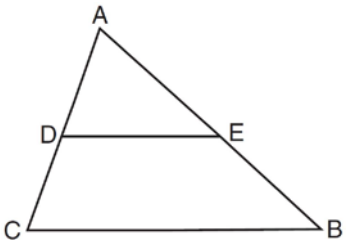
1) 6
2) 7
3) 9
4) 12

14 In the diagram of $\triangle UVW$ below, A is the midpoint of $\overline{UV}$, B is the midpoint of $\overline{UW}$, C is the midpoint of $\overline{VW}$, and $\overline{AB}$ and $\overline{AC}$ are drawn.



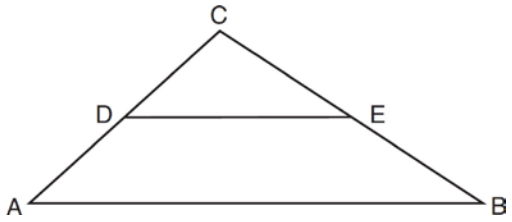
If $VW = 7x - 3$ and $AB = 3x + 1$, what is the length of $\overline{VC}$?
1) 5
2) 13
3) 16
4) 32

15 Triangle ABC is shown in the diagram below.



If $\overline{DE}$ joins the midpoints of $\overline{ADC}$ and $\overline{AEB}$, which statement is *not* true?
1) $DE = \frac{1}{2} CB$
2) $\overline{DE} \parallel \overline{CB}$
3) $\frac{AD}{DC} = \frac{DE}{CB}$
4) $\triangle ABC \sim \triangle AED$

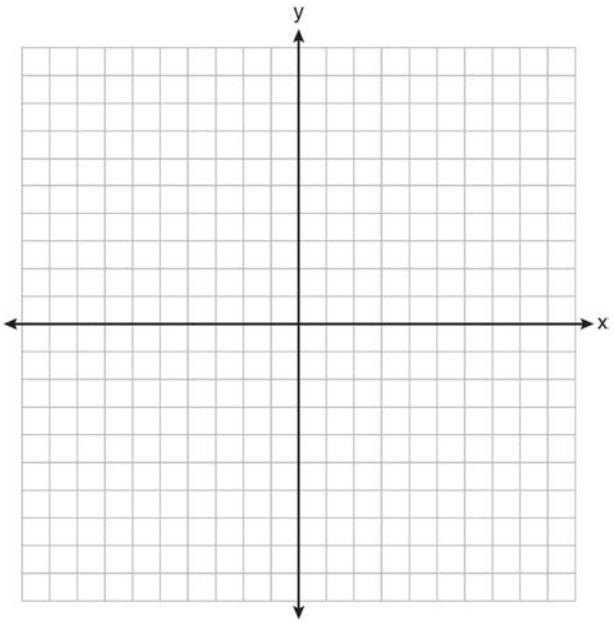
16 In the diagram below, $\overline{DE}$ joins the midpoints of two sides of $\triangle ABC$.



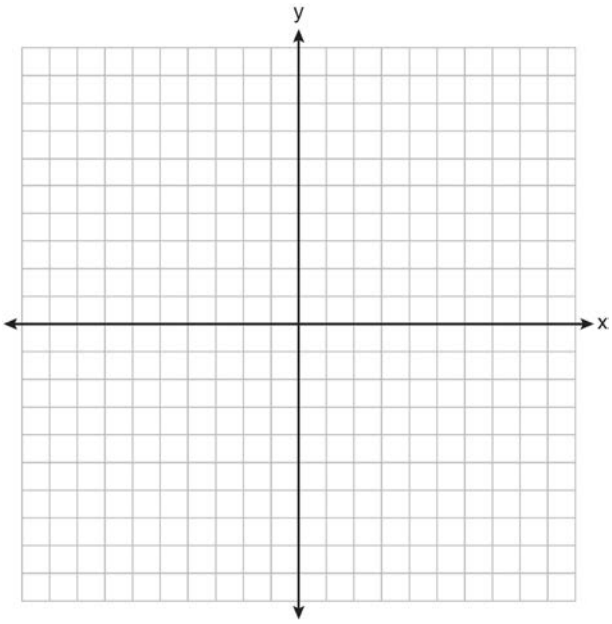
Which statement is *not* true?
1) $CE = \frac{1}{2} CB$
2) $DE = \frac{1}{2} AB$
3) area of $\triangle CDE = \frac{1}{2}$ area of $\triangle CAB$
4) perimeter of $\triangle CDE = \frac{1}{2}$ perimeter of $\triangle CAB$

Name: _____

17 On the set of axes below, graph and label $\triangle DEF$ with vertices at $D(-4,-4)$, $E(-2,2)$, and $F(8,-2)$. If G is the midpoint of $\overline{EF}$ and H is the midpoint of $\overline{DF}$, state the coordinates of G and H and label each point on your graph. Explain why $\overline{GH} \parallel \overline{DE}$.



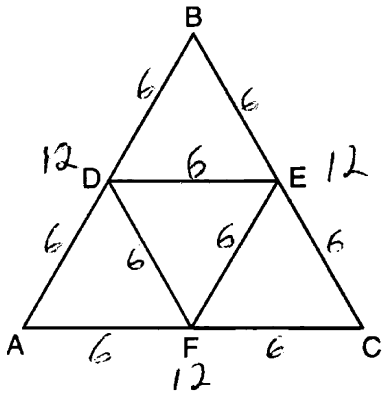
18 Triangle HKL has vertices $H(-7,2)$, $K(3,-4)$, and $L(5,4)$. The midpoint of $\overline{HL}$ is M and the midpoint of $\overline{LK}$ is N. Determine and state the coordinates of points M and N. Justify the statement: $\overline{MN}$ is parallel to $\overline{HK}$. [The use of the set of axes below is optional.]



G.CO.C.10: Midsegments
Answer Section

1 ANS: 4 REF: 081716geo

2 ANS: 1



REF: 081003ge

3 ANS:

$2x + 7 = 25$ $NT = 4.5$

$2x = 18$

$x = 9$

REF: 081531ge

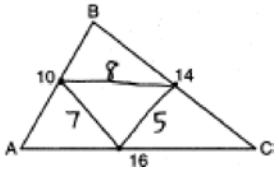
4 ANS:

37. Since $\overline{DE}$ is a midsegment, $AC = 14$. $10 + 13 + 14 = 37$

REF: 061030ge

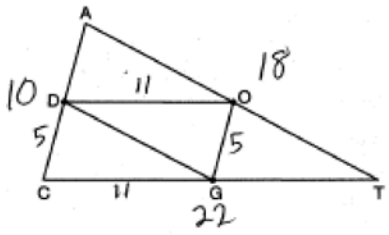
5 ANS:

20. The sides of the triangle formed by connecting the midpoints are half the sides of the original triangle.

$5 + 7 + 8 = 20$. 

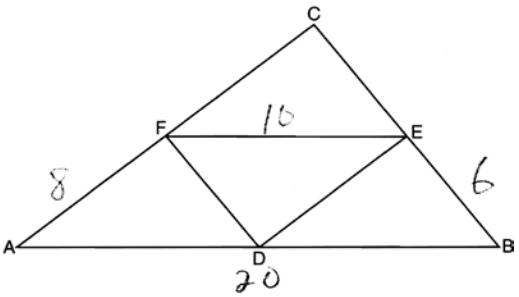
REF: 060929ge

6 ANS: 3



REF: 080920ge

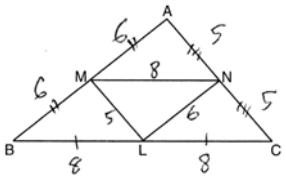
7 ANS: 4



$20 + 8 + 10 + 6 = 44.$

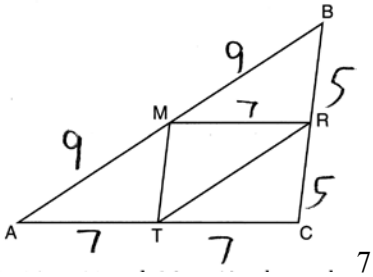
REF: 061211ge

8 ANS: 1



REF: 011413ge

9 ANS: 1

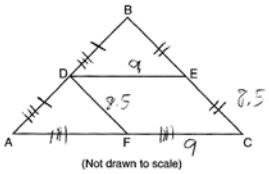


$7 + 7 + 5 + 7 + 9 = 35$

REF: 011611ge

10 ANS: 4 REF: 011704geo

11 ANS:



$8.5 + 9 + 8.5 + 9 = 35$

REF: 081430ge

12 ANS: 2

$$\frac{4x + 10}{2} = 2x + 5$$

REF: 011103ge

13 ANS: 3

$3x - 15 = 2(6)$

$3x = 27$

$x = 9$

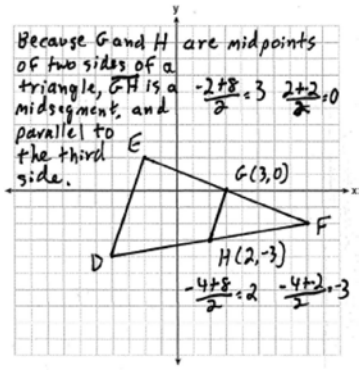
REF: 061311ge

14 ANS: 3 REF: 081320ge

15 ANS: 3 REF: 011311ge

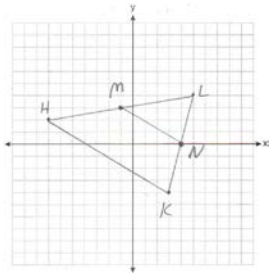
16 ANS: 3 REF: 081227ge

17 ANS:



REF: fall0835ge

18 ANS:



$M\left(\frac{-7+5}{2}, \frac{2+4}{2}\right) = M(-1,3)$. $N\left(\frac{3+5}{2}, \frac{-4+4}{2}\right) = N(4,0)$. $\overline{MN}$ is a midsegment.

REF: 011237ge