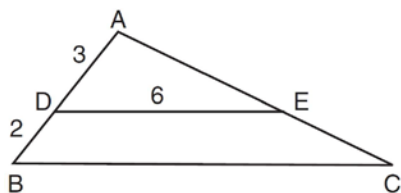


G.G.46: Side Splitter Theorem: Investigate proportions among segments of sides of the triangle, given line(s) parallel to one side and intersecting the other sides of the triangle

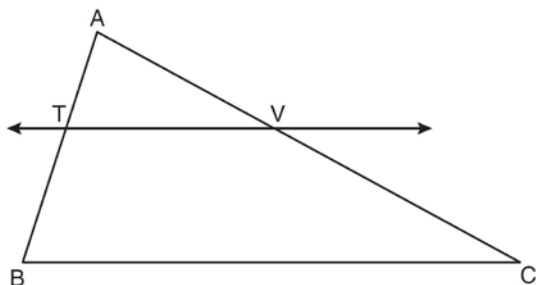
- 1 In the diagram of $\triangle ABC$ below, $\overline{DE} \parallel \overline{BC}$, $AD = 3$, $DB = 2$, and $DE = 6$.



What is the length of \overline{BC} ?

- 1) 12
- 2) 10
- 3) 8
- 4) 4

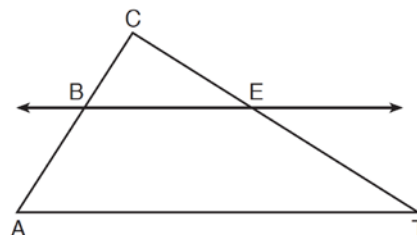
- 2 In the diagram below of $\triangle ABC$, $\overleftrightarrow{TV} \parallel \overline{BC}$, $AT = 5$, $TB = 7$, and $AV = 10$.



What is the length of \overline{VC} ?

- 1) $3\frac{1}{2}$
- 2) $7\frac{1}{7}$
- 3) 14
- 4) 24

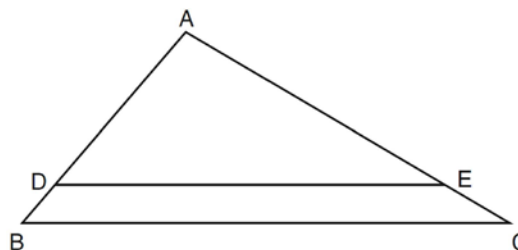
- 3 In the diagram below of $\triangle ACT$, $\overleftrightarrow{BE} \parallel \overline{AT}$.



If $CB = 3$, $CA = 10$, and $CE = 6$, what is the length of \overline{ET} ?

- 1) 5
- 2) 14
- 3) 20
- 4) 26

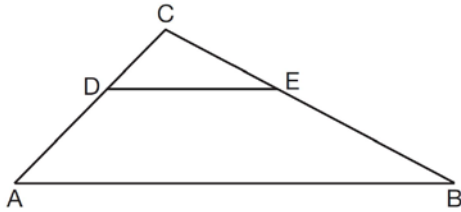
- 4 In the diagram of $\triangle ABC$ shown below, $\overline{DE} \parallel \overline{BC}$.



If $AB = 10$, $AD = 8$, and $AE = 12$, what is the length of \overline{EC} ?

- 1) 6
- 2) 2
- 3) 3
- 4) 15

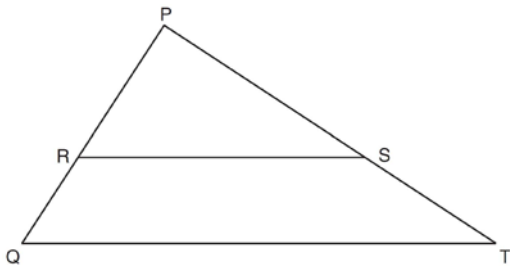
- 5 In the diagram of $\triangle ABC$ below, $\overline{DE} \parallel \overline{AB}$.



If $CD = 4$, $CA = 10$, $CE = x + 2$, and $EB = 4x - 7$, what is the length of \overline{CE} ?

- 1) 10
- 2) 8
- 3) 6
- 4) 4

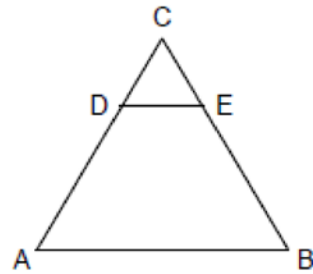
- 6 Triangle PQT with $\overline{RS} \parallel \overline{QT}$ is shown below.



If $PR = 12$, $RQ = 8$, and $PS = 21$, what is the length of \overline{PT} ?

- 1) 14
- 2) 17
- 3) 35
- 4) 38

- 7 In the accompanying diagram of equilateral triangle ABC , $DE = 5$ and $\overline{DE} \parallel \overline{AB}$.



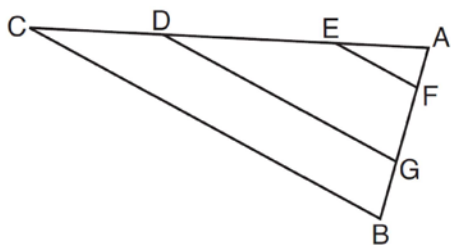
If AB is three times as long as DE , what is the perimeter of quadrilateral $ABED$?

- 1) 20
- 2) 30
- 3) 35
- 4) 40

- 8 In $\triangle ABC$, point D is on \overline{AB} , and point E is on \overline{BC} such that $\overline{DE} \parallel \overline{AC}$. If $DB = 2$, $DA = 7$, and $DE = 3$, what is the length of \overline{AC} ?

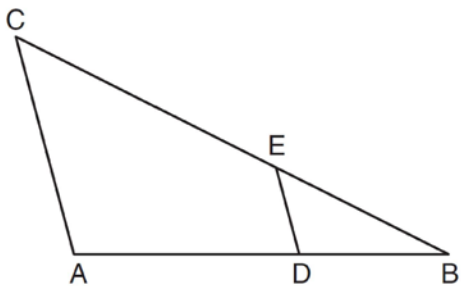
- 1) 8
- 2) 9
- 3) 10.5
- 4) 13.5

- 9 In the diagram below of $\triangle ABC$, with \overline{CDEA} and \overline{BGFA} , $\overline{EF} \parallel \overline{DG} \parallel \overline{CB}$.

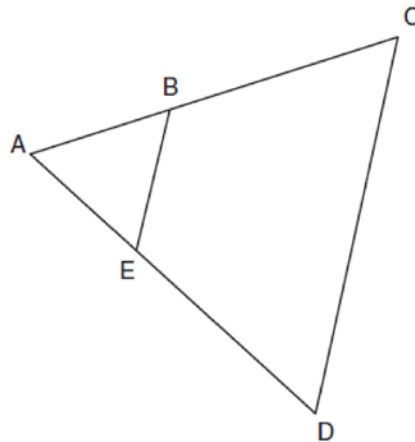


Which statement is *false*?

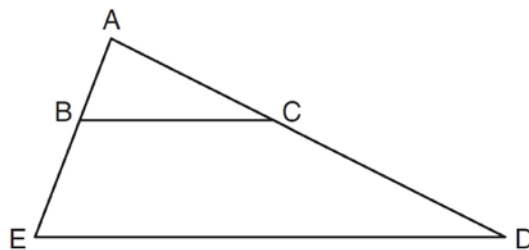
- 1) $\frac{AC}{AD} = \frac{AB}{AG}$
 - 2) $\frac{AE}{AF} = \frac{AC}{AB}$
 - 3) $\frac{AE}{AD} = \frac{EC}{AC}$
 - 4) $\frac{BG}{BA} = \frac{CD}{CA}$
- 10 In the diagram below of $\triangle ABC$, D is a point on \overline{AB} , E is a point on \overline{BC} , $\overline{AC} \parallel \overline{DE}$, $CE = 25$ inches, $AD = 18$ inches, and $DB = 12$ inches. Find, to the nearest tenth of an inch, the length of \overline{EB} .



- 11 In the diagram below of $\triangle ACD$, E is a point on \overline{AD} and B is a point on \overline{AC} , such that $\overline{EB} \parallel \overline{DC}$. If $\overline{AE} = 3$, $\overline{ED} = 6$, and $\overline{DC} = 15$, find the length of \overline{EB} .



- 12 In the diagram below of $\triangle ADE$, B is a point on \overline{AE} and C is a point on \overline{AD} such that $\overline{BC} \parallel \overline{ED}$, $AC = x - 3$, $BE = 20$, $AB = 16$, and $AD = 2x + 2$. Find the length of \overline{AC} .



G.G.46: Side Splitter Theorem: Investigate proportions among segments of sides of the triangle, given line(s) parallel to one side and intersecting the other sides of the triangle
Answer Section

1 ANS: 2

$$\frac{3}{6} = \frac{5}{x}$$

$$3x = 30$$

$$x = 10$$

REF: 081423ge

2 ANS: 3

$$\frac{5}{7} = \frac{10}{x}$$

$$5x = 70$$

$$x = 14$$

REF: 081103ge

3 ANS: 2

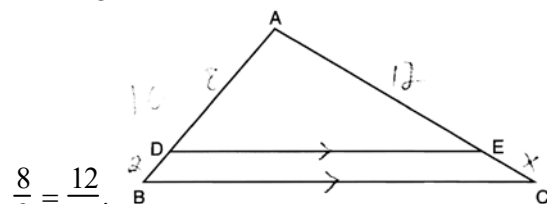
$$\frac{3}{7} = \frac{6}{x}$$

$$3x = 42$$

$$x = 14$$

REF: 081027ge

4 ANS: 3



$$\frac{8}{2} = \frac{12}{x}$$

$$8x = 24$$

$$x = 3$$

REF: 061216ge

5 ANS: 3

$$\frac{4}{6} = \frac{x+2}{4x-7}$$

$$16x - 28 = 6x + 12$$

$$10x = 40$$

$$x = 4$$

REF: 011521ge

6 ANS: 3

$$\frac{12}{8} = \frac{21}{x} \quad 21 + 14 = 35$$

$$12x = 168$$

$$x = 14$$

REF: 061426ge

7 ANS: 4

REF: 089915a

8 ANS: 4

REF: 060927ge

9 ANS: 3

REF: 081507ge

10 ANS:

$$16.7. \quad \frac{x}{25} = \frac{12}{18}$$

$$18x = 300$$

$$x \approx 16.7$$

REF: 061133ge

11 ANS:

$$5$$

REF: 011033ge

12 ANS:

$$32. \quad \frac{16}{20} = \frac{x-3}{x+5} \quad . \quad \overline{AC} = x - 3 = 35 - 3 = 32$$

$$16x + 80 = 20x - 60$$

$$140 = 4x$$

$$35 = x$$

REF: 011137ge