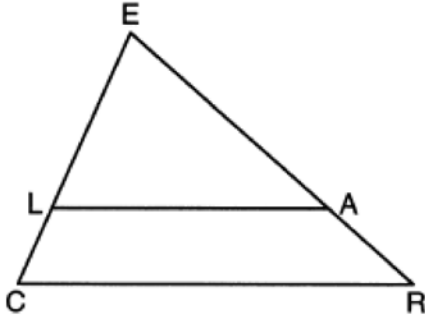


G.SRT.B.4: Side Splitter Theorem 1

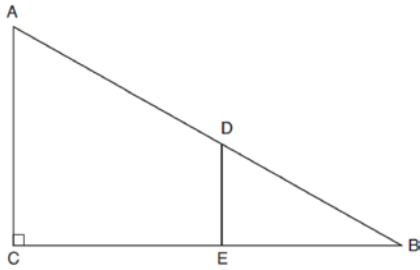
- 1 In the diagram below of $\triangle CER$, $\overline{LA} \parallel \overline{CR}$.



If $CL = 3.5$, $LE = 7.5$, and $EA = 9.5$, what is the length of AR , to the nearest tenth?

- 1) 5.5
- 2) 4.4
- 3) 3.0
- 4) 2.8

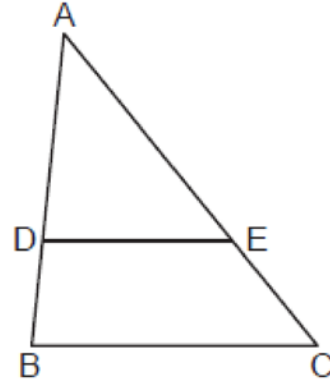
- 2 In right triangle ABC shown below, point D is on \overline{AB} and point E is on \overline{CB} such that $\overline{AC} \parallel \overline{DE}$.



If $AB = 15$, $BC = 12$, and $EC = 7$, what is the length of BD ?

- 1) 8.75
- 2) 6.25
- 3) 5
- 4) 4

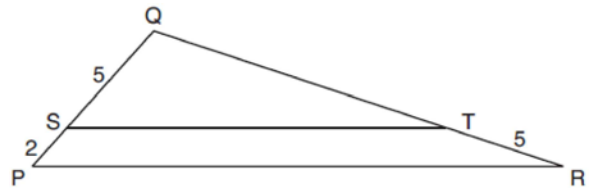
- 3 In triangle ABC below, D is a point on \overline{AB} and E is a point on \overline{AC} , such that $\overline{DE} \parallel \overline{BC}$.



If $AD = 12$, $DB = 8$, and $EC = 10$, what is the length of AC ?

- 1) 15
- 2) 22
- 3) 24
- 4) 25

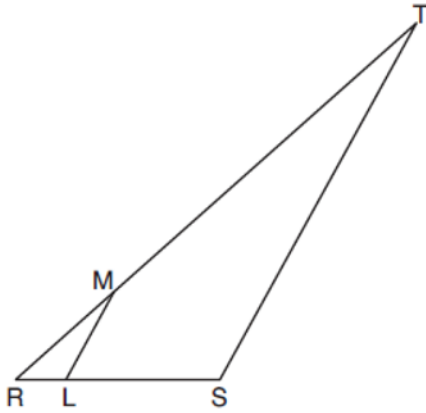
- 4 In the diagram below of $\triangle PQR$, \overline{ST} is drawn parallel to \overline{PR} , $PS = 2$, $SQ = 5$, and $TR = 5$.



What is the length of \overline{QR} ?

- 1) 7
- 2) 2
- 3) $12\frac{1}{2}$
- 4) $17\frac{1}{2}$

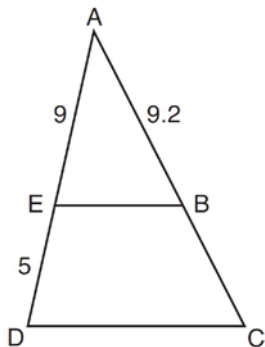
- 5 In the diagram below of $\triangle RST$, L is a point on \overline{RS} , and M is a point on \overline{RT} , such that $LM \parallel \overline{ST}$.



If $RL = 2$, $LS = 6$, $LM = 4$, and $ST = x + 2$, what is the length of \overline{ST} ?

- 1) 10
- 2) 12
- 3) 14
- 4) 16

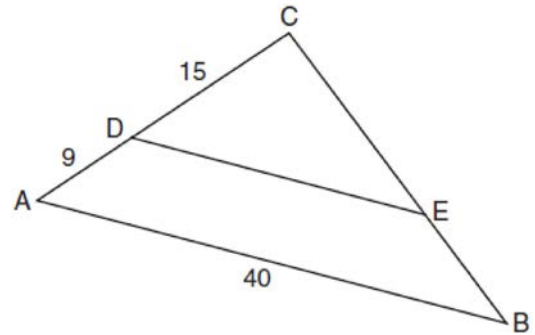
- 6 In the diagram of $\triangle ADC$ below, $\overline{EB} \parallel \overline{DC}$, $AE = 9$, $ED = 5$, and $AB = 9.2$.



What is the length of \overline{AC} , to the nearest tenth?

- 1) 5.1
- 2) 5.2
- 3) 14.3
- 4) 14.4

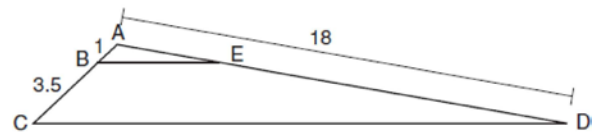
- 7 In the diagram of $\triangle ABC$ below, \overline{DE} is parallel to \overline{AB} , $CD = 15$, $AD = 9$, and $AB = 40$.



The length of \overline{DE} is

- 1) 15
- 2) 24
- 3) 25
- 4) 30

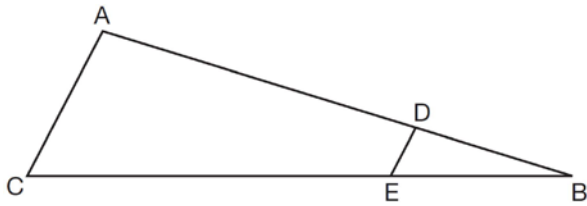
- 8 In the diagram below, triangle ACD has points B and E on sides \overline{AC} and \overline{AD} , respectively, such that $\overline{BE} \parallel \overline{CD}$, $AB = 1$, $BC = 3.5$, and $AD = 18$.



What is the length of \overline{AE} , to the nearest tenth?

- 1) 14.0
- 2) 5.1
- 3) 3.3
- 4) 4.0

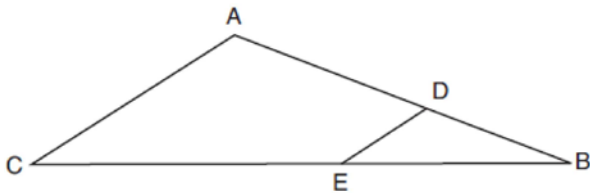
- 9 In the diagram of $\triangle ABC$, points D and E are on \overline{AB} and \overline{CB} , respectively, such that $\overline{AC} \parallel \overline{DE}$.



If $AD = 24$, $DB = 12$, and $DE = 4$, what is the length of AC ?

- 1) 8
- 2) 12
- 3) 16
- 4) 72

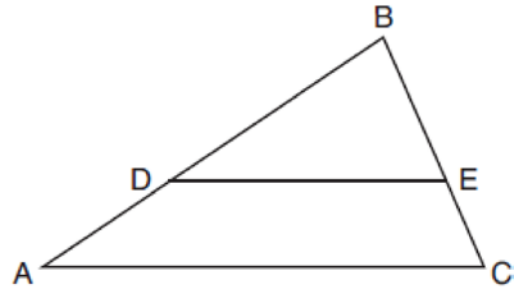
- 10 In the diagram of $\triangle ABC$ below, points D and E are on sides AB and CB respectively, such that $\overline{DE} \parallel \overline{AC}$.



If EB is 3 more than DB , $AB = 14$, and $CB = 21$, what is the length of AD ?

- 1) 6
- 2) 8
- 3) 9
- 4) 12

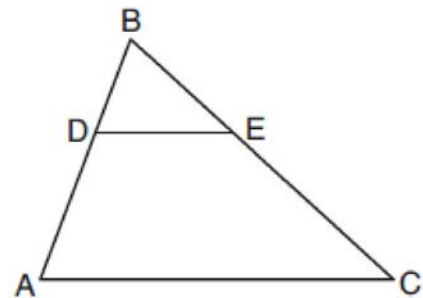
- 11 In triangle ABC , points D and E are on sides \overline{AB} and \overline{BC} , respectively, such that $\overline{DE} \parallel \overline{AC}$, and $AD:DB = 3:5$.



If $DB = 6.3$ and $AC = 9.4$, what is the length of DE , to the nearest tenth?

- 1) 3.8
- 2) 5.6
- 3) 5.9
- 4) 15.7

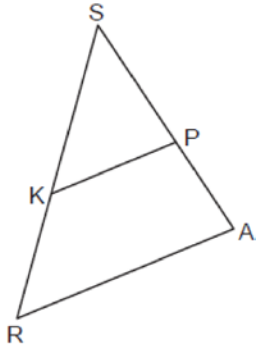
- 12 In the diagram below of $\triangle ABC$, D is a point on \overline{BA} , E is a point on \overline{BC} , and \overline{DE} is drawn.



If $BD = 5$, $DA = 12$, and $BE = 7$, what is the length of BC so that $\overline{AC} \parallel \overline{DE}$?

- 1) 23.8
- 2) 16.8
- 3) 15.6
- 4) 8.6

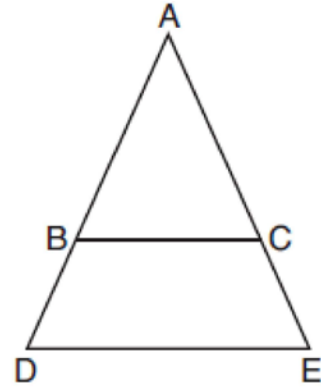
- 13 In the diagram of $\triangle SRA$ below, \overline{KP} is drawn such that $\angle SKP \cong \angle SRA$.



If $SK = 10$, $SP = 8$, and $PA = 6$, what is the length of \overline{KR} , to the nearest tenth?

- 1) 4.8
- 2) 7.5
- 3) 8.0
- 4) 13.3

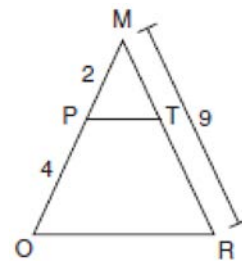
- 14 In the diagram below, \overline{BC} connects points B and C on the congruent sides of isosceles triangle ADE , such that $\triangle ABC$ is isosceles with vertex angle A .



If $AB = 10$, $BD = 5$, and $DE = 12$, what is the length of \overline{BC} ?

- 1) 6
- 2) 7
- 3) 8
- 4) 9

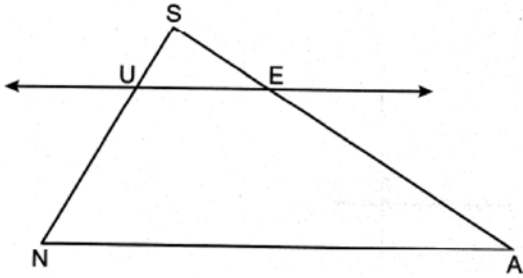
- 15 Given $\triangle MRO$ shown below, with trapezoid $PTRO$, $MR = 9$, $MP = 2$, and $PO = 4$.



What is the length of \overline{TR} ?

- 1) 4.5
- 2) 5
- 3) 3
- 4) 6

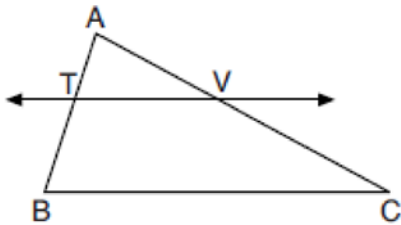
16 In $\triangle SNA$ below, $\overleftrightarrow{UE} \parallel \overline{NA}$.



If $SU = 3$, $SN = 11$, and $EA = 13$, what is the length of SE , to the nearest tenth?

- 1) 2.5
- 2) 3.5
- 3) 4.9
- 4) 17.9

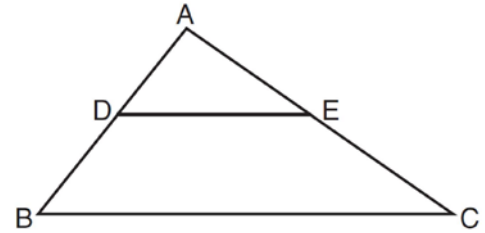
17 In the diagram below of $\triangle ABC$, \overleftrightarrow{TV} intersects \overline{AB} and \overline{AC} at points T and V respectively, and $m\angle ATV = m\angle ABC$.



If $AT = 4$, $BC = 18$, $TB = 5$, and $AV = 6$, what is the perimeter of quadrilateral $TBCV$?

- 1) 38.5
- 2) 39.5
- 3) 40.5
- 4) 44.9

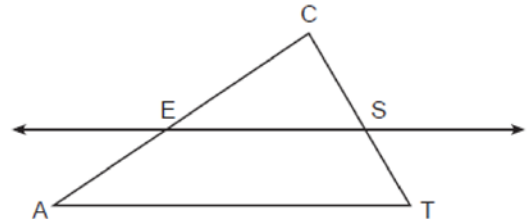
18 In the diagram below, $\triangle ABC \sim \triangle ADE$.



Which measurements are justified by this similarity?

- 1) $AD = 3$, $AB = 6$, $AE = 4$, and $AC = 12$
- 2) $AD = 5$, $AB = 8$, $AE = 7$, and $AC = 10$
- 3) $AD = 3$, $AB = 9$, $AE = 5$, and $AC = 10$
- 4) $AD = 2$, $AB = 6$, $AE = 5$, and $AC = 15$

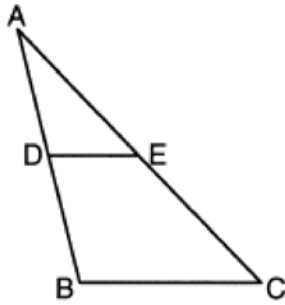
19 In the diagram below of $\triangle ACT$, \overleftrightarrow{ES} is drawn parallel to \overline{AT} such that E is on \overline{CA} and S is on \overline{CT} .



Which statement is always true?

- 1) $\frac{CE}{CA} = \frac{CS}{CT}$
- 2) $\frac{CE}{ES} = \frac{EA}{AT}$
- 3) $\frac{CE}{EA} = \frac{CS}{ST}$
- 4) $\frac{CE}{ST} = \frac{EA}{CS}$

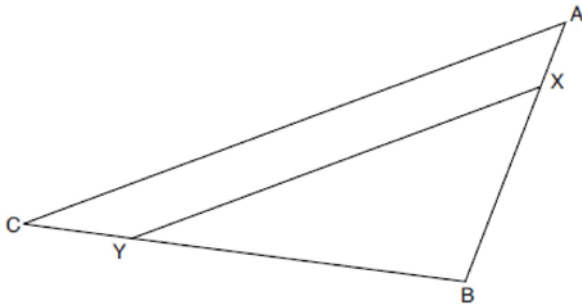
- 20 In $\triangle ABC$ below, \overline{DE} is drawn such that D and E are on \overline{AB} and \overline{AC} , respectively.



If $\overline{DE} \parallel \overline{BC}$, which equation will always be true?

- 1) $\frac{AD}{DE} = \frac{DB}{BC}$
- 2) $\frac{AD}{DE} = \frac{AB}{BC}$
- 3) $\frac{AD}{BC} = \frac{DE}{DB}$
- 4) $\frac{AD}{BC} = \frac{DE}{AB}$

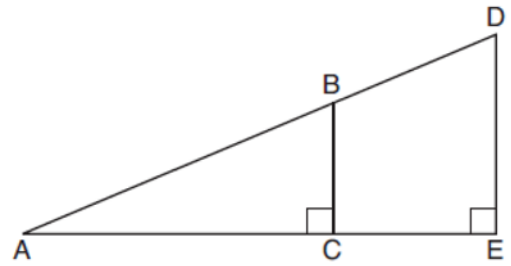
- 21 The diagram below shows triangle ABC with point X on side \overline{AB} and point Y on side \overline{CB} .



Which information is sufficient to prove that $\triangle BXY \sim \triangle BAC$?

- 1) $\angle B$ is a right angle.
- 2) \overline{XY} is parallel to \overline{AC} .
- 3) $\triangle ABC$ is isosceles.
- 4) $\overline{AX} \cong \overline{CY}$

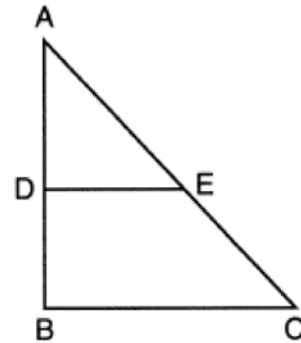
- 22 In the diagram below of right triangle AED , $\overline{BC} \parallel \overline{DE}$.



Which statement is always true?

- 1) $\frac{AC}{BC} = \frac{DE}{AE}$
- 2) $\frac{AB}{AD} = \frac{BC}{DE}$
- 3) $\frac{AC}{CE} = \frac{BC}{DE}$
- 4) $\frac{DE}{BC} = \frac{DB}{AB}$

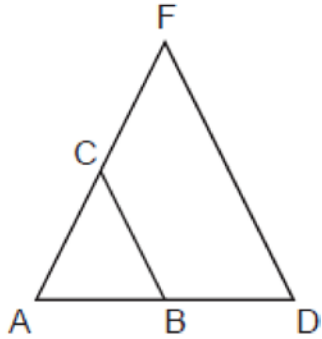
- 23 In triangle ABC below, D is a point on \overline{AB} and E is a point on \overline{AC} , such that $\overline{DE} \parallel \overline{BC}$.



Which statement is always true?

- 1) $\angle ADE$ and $\angle ABC$ are right angles.
- 2) $\triangle ADE \sim \triangle ABC$
- 3) $DE = \frac{1}{2} BC$
- 4) $\overline{AD} \cong \overline{DB}$

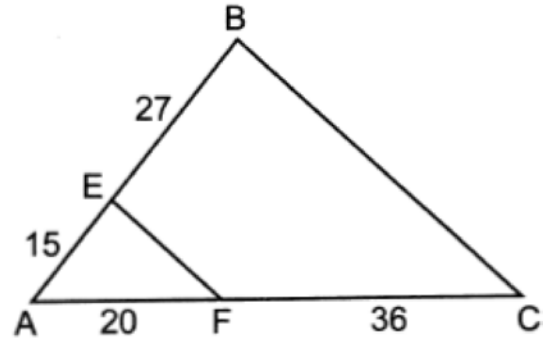
- 24 Triangle ADF is drawn and $\overline{BC} \parallel \overline{DF}$.



Which statement must be true?

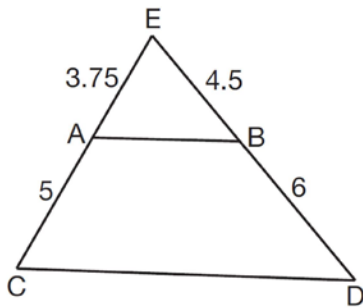
- 1) $\frac{AB}{BC} = \frac{BD}{DF}$
- 2) $BC = \frac{1}{2}DF$
- 3) $AB:AD = AC:CF$
- 4) $\angle ACB \cong \angle AFD$

- 26 In the diagram below, $AE = 15$, $EB = 27$, $AF = 20$, and $FC = 36$.



Explain why $\overline{EF} \parallel \overline{BC}$.

- 25 In $\triangle CED$ as shown below, points A and B are located on sides \overline{CE} and \overline{ED} , respectively. Line segment \overline{AB} is drawn such that $AE = 3.75$, $AC = 5$, $EB = 4.5$, and $BD = 6$.



Explain why \overline{AB} is parallel to \overline{CD} .

G.SRT.B.4: Side Splitter Theorem 1
Answer Section

1 ANS: 2

$$\frac{7.5}{3.5} = \frac{9.5}{x}$$

$$x \approx 4.4$$

REF: 012303geo

2 ANS: 2

$$\frac{x}{15} = \frac{5}{12}$$

$$x = 6.25$$

REF: 011906geo

3 ANS: 4

$$\frac{x}{10} = \frac{12}{8} \quad 15 + 10 = 25$$

$$x = 15$$

REF: 082314geo

4 ANS: 4

$$\frac{5}{7} = \frac{x}{x+5} \quad 12\frac{1}{2} + 5 = 17\frac{1}{2}$$

$$5x + 25 = 7x$$

$$2x = 25$$

$$x = 12\frac{1}{2}$$

REF: 061821geo

5 ANS: 4

$$\frac{2}{4} = \frac{8}{x+2} \quad 14 + 2 = 16$$

$$2x + 4 = 32$$

$$x = 14$$

REF: 012024geo

6 ANS: 3

$$\frac{9}{5} = \frac{9.2}{x} \quad 5.1 + 9.2 = 14.3$$

$$9x = 46$$

$$x \approx 5.1$$

REF: 061511geo

7 ANS: 3

$$\frac{24}{40} = \frac{15}{x}$$

$$24x = 600$$

$$x = 25$$

REF: 011813geo

8 ANS: 4

$$\frac{1}{3.5} = \frac{x}{18-x}$$

$$3.5x = 18 - x$$

$$4.5x = 18$$

$$x = 4$$

REF: 081707geo

9 ANS: 2

$$\frac{12}{4} = \frac{36}{x}$$

$$12x = 144$$

$$x = 12$$

REF: 061621geo

10 ANS: 2

$$\frac{x}{x+3} = \frac{14}{21} \quad 14 - 6 = 8$$

$$21x = 14x + 42$$

$$7x = 42$$

$$x = 6$$

REF: 081812geo

11 ANS: 3

$$\frac{x}{6.3} = \frac{3}{5} \quad \frac{y}{9.4} = \frac{6.3}{6.3 + 3.78}$$

$$x = 3.78 \quad y \approx 5.9$$

REF: 081816geo

12 ANS: 1

$$5x = 12 \cdot 7 \quad 16.8 + 7 = 23.8$$

$$5x = 84$$

$$x = 16.8$$

REF: 061911geo

13 ANS: 2

$$\frac{10}{x} = \frac{8}{6}$$

$$8x = 60$$

$$x = 7.5$$

REF: 012402geo

14 ANS: 3

$$\frac{10}{x} = \frac{15}{12}$$

$$x = 8$$

REF: 081918geo

15 ANS: 4

$$\frac{2}{4} = \frac{9-x}{x}$$

$$36 - 4x = 2x$$

$$x = 6$$

REF: 061705geo

16 ANS: 3

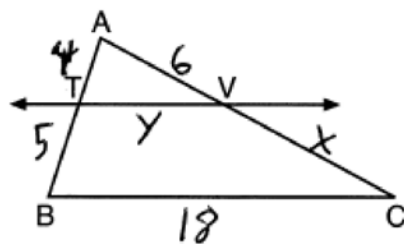
$$\frac{x}{13} = \frac{3}{8}$$

$$8x = 39$$

$$x \approx 4.9$$

REF: 082405geo

17 ANS: 4



$$\frac{4}{5} = \frac{6}{x} \quad \frac{4}{9} = \frac{y}{18} \quad 5 + 18 + 7.5 + 8 = 38.5$$

$$x = 7.5 \quad y = 8$$

REF: 082222geo

18 ANS: 4

$$\frac{2}{6} = \frac{5}{15}$$

REF: 081517geo

19 ANS: 3

REF: 062307geo

20 ANS: 2

$$\triangle ACB \sim \triangle AED$$

REF: 012308geo

21 ANS: 2

If (2) is true, $\angle ACB \cong \angle XYB$ and $\angle CAB \cong \angle YXB$.

REF: 082202geo

22 ANS: 2

$$\triangle ACB \sim \triangle AED$$

REF: 061811geo

23 ANS: 2

$$\angle ADE \cong \angle ABC \text{ and } \angle AED \cong \angle ACB$$

REF: 062214geo

24 ANS: 4

REF: 062321geo

25 ANS:

$$\frac{3.75}{5} = \frac{4.5}{6} \quad \overline{AB} \text{ is parallel to } \overline{CD} \text{ because } \overline{AB} \text{ divides the sides proportionately.}$$

$$39.375 = 39.375$$

REF: 061627geo

26 ANS:

$$\frac{15}{27} = \frac{20}{36} \quad \overline{EF} \text{ is parallel to } \overline{BC} \text{ because } \overline{EF} \text{ divides the sides proportionately.}$$

$$540 = 540$$

REF: 062431geo