

Workbook

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#9

Statement	Justification
1. $AD \parallel BC$	$ABCD$ is a trapezoid (hypothesis)
2. $\angle ADI \cong \angle IBC$	AIA formed by the transversal line BD through parallel lines AD and BC .
3. $\angle AID \cong \angle BIC$	Vertically opposite angles
4. $\triangle AID \cong \triangle CIB$	AA

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#12 a)

Statement	Justification
1. $\angle BAC \cong \angle DAE$	Vertically opposite angles
2. $\frac{m\overline{AB}}{m\overline{AD}} = \frac{m\overline{AC}}{m\overline{AE}}$	$\frac{2.4}{4.8} = \frac{3.6}{7.2} = \frac{1}{2}$ (corresponding sides are proportional)
3. $\triangle ABC \cong \triangle ADE$	SAS

- b) The angles CBA and EDA are congruent (corresponding angles in 2 similar triangles). Lines BC and DE, intersected by the transversal line BD, determine the angles CBA and EDA that are alternate-interior and congruent. Lines BC and DE are therefore parallel by the converse of the parallel lines theorem.

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#2 a) $x = 8$ b) $x = 13$ c) $x = 4$ d) $x = 2.8$

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$$\#5 \quad \frac{m\overline{AB}}{m\overline{AE}} = \frac{m\overline{AC}}{m\overline{AD}} \rightarrow \frac{x+3}{x} = \frac{2x+2}{x+1} \rightarrow x = 3$$

$$\#6 \quad \angle OAB \cong \angle ODC \text{ and } \angle ABO \cong \angle OCD \text{ (Alternate interior angles)}$$

$$\triangle AOB \sim \triangle DOC \text{ (AA similarity theorem)}$$

$$\frac{m\overline{OA}}{m\overline{OD}} = \frac{m\overline{AB}}{m\overline{CD}} \rightarrow \frac{2}{3} = \frac{4}{x} \rightarrow m\overline{CD} = 6 \text{ cm}$$

$$\#7 \quad \frac{x+4}{x+1} = \frac{3x+2}{x+2} \rightarrow (x+4)(x+2) = (3x+2)(x+1)$$

$$2x^2 - x - 6 = 0 \rightarrow x = 2$$

$$m\overline{AB} = 6; m\overline{AC} = 8; m\overline{BC} = 10 \rightarrow \text{Perimeter of } \triangle ABC = 24u$$

$$\#8 \quad \text{Height of tree} = 7.5 \text{ cm.}$$

$$\#9 \quad x = 2 \text{ cm}$$

$$\#10 \quad x = m\overline{BC} = 42.4 u$$