

Name: Kelly

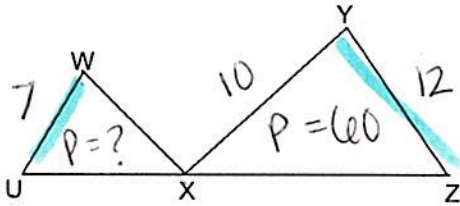
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UNIT 5

LESSON 4

AIM: HOW DO WE USE THE SIDE-SPLITTER THEOREM WHEN THE PARALLEL BASES ARE LABELED?

Do Now: In the diagram below, $\triangle XWU \sim \triangle XYZ$. If $WU = 7$, $YZ = 12$, $WX = 10$, and the perimeter of $\triangle XYZ$ is 60, what is the perimeter of $\triangle XWU$?



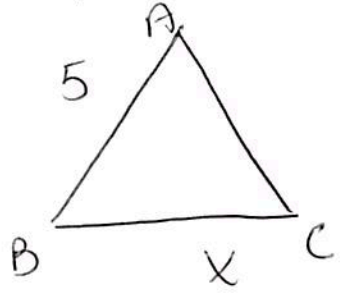
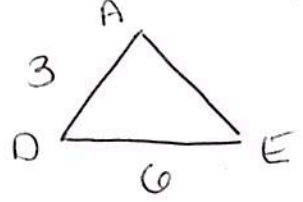
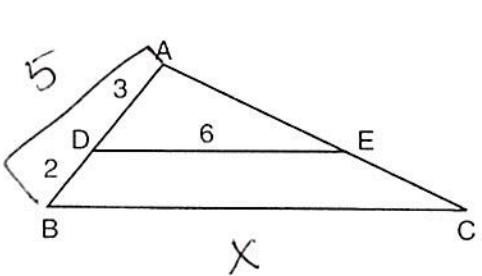
$$\frac{7}{x} = \frac{12}{60}$$

$$12x = 420$$

$$x = 35$$

Triangle Side Splitter working with BASES (sides)	Steps to Solve problems involving the bases (parallel sides)
	<ul style="list-style-type: none"> Separate the <u>big</u> \triangle and the <u>small</u> \triangle Create a proportion using <u>corresponding</u> sides

EXAMPLE #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} ?

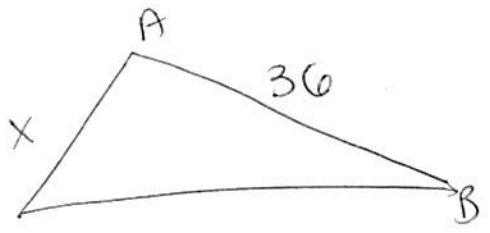
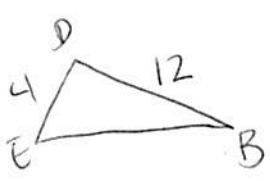
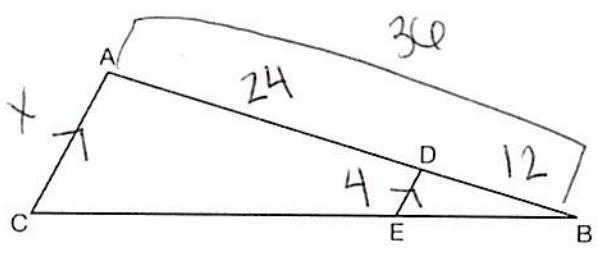


$$\frac{3}{6} = \frac{5}{x}$$

$$3x = 30$$

$$x = 10$$

EXAMPLE #2: 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 \overline{AC} ?



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

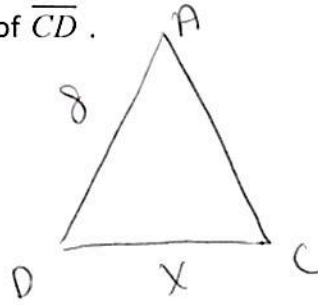
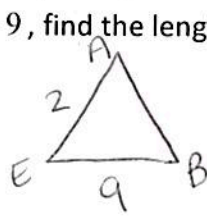
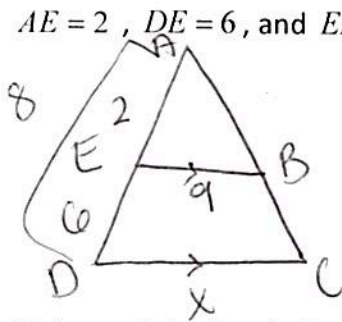
$$144 = 12x$$

$$x = 12$$

$$\overline{AC} = 12$$

PRACTICE PROBLEMS

1. 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 $AE = 2$, $DE = 6$, and $EB = 9$, find the length of \overline{CD} .



$$\frac{2}{9} = \frac{8}{x}$$

$$72 = 2x$$

$$x = 36$$

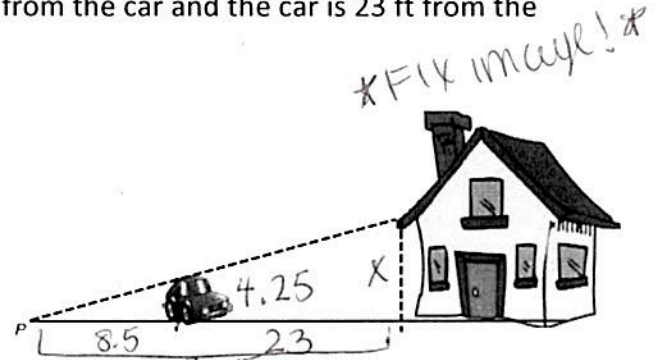
$CD = 36$

2. Chris needs to fix a leaky roof on his mom's house but doesn't own a ladder. He thinks that a 25-foot ladder will be long enough to reach the roof, but he needs to be sure before he spends the money to buy one. He chooses a point P on the ground where he can visually align the roof of his 4.25 ft tall car with the edge of the roof of the house. If point P is 8.5 ft from the car and the car is 23 ft from the house, how tall is the house?

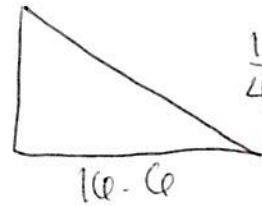
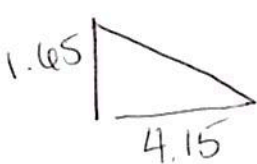
$$\frac{8.5}{4.25} = \frac{31.5}{x}$$

$$8.5x = 133.875$$

$x = 15.75 \text{ ft}$



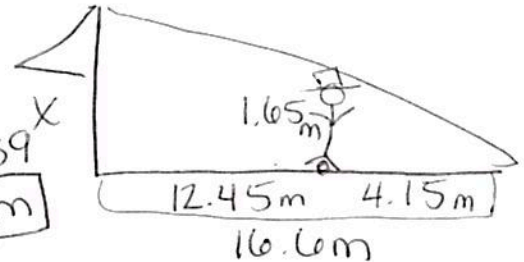
3. A flagpole casts a shadow 16.60 meters long. Tim stands at a distance of 12.45 meters from the base of the flagpole, such that the end of Tim's shadow meets the end of the flagpole's shadow. If Tim is 1.65 meters tall, determine and state the height of the flagpole to the nearest tenth of a meter.



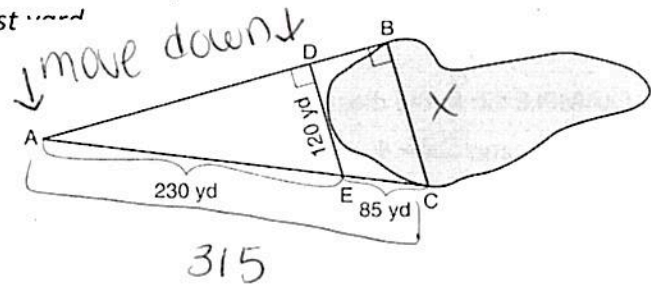
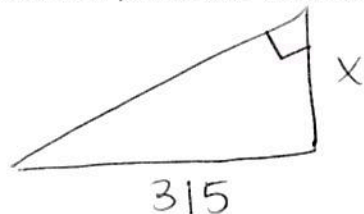
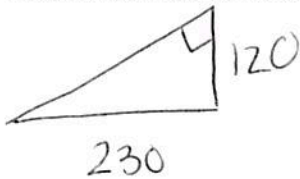
$$\frac{1.65}{4.15} = \frac{x}{16.60}$$

$$4.15x = 27.39$$

$x = 6.6 \text{ m}$



4. To find the distance across a pond from point B to point C , a surveyor drew the diagram below. The measurements he made are indicated on his diagram. Use the surveyor's information to determine and state the distance from point B to point C , to the nearest yard.



$$\frac{230}{120} = \frac{315}{x}$$

$$230x = 37800$$

$$x = 164.3478$$

164 yds

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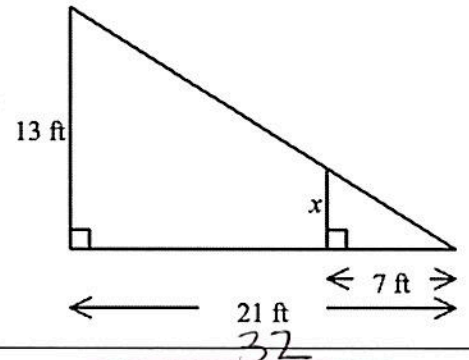
HOMEWORK

1. Solve for x to the nearest tenth.

$$\frac{7}{x} = \frac{21}{13}$$

$$21x = 91$$

$$x = 4.3$$

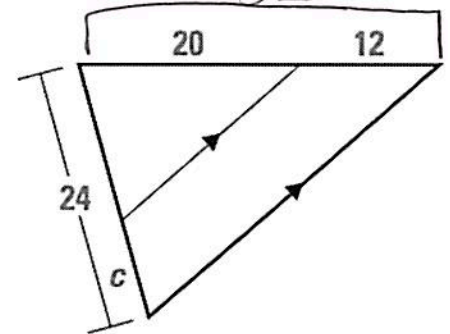


2. Solve for c.

$$\frac{32}{12} = \frac{24}{c}$$

$$32c = 288$$

$$c = 9$$



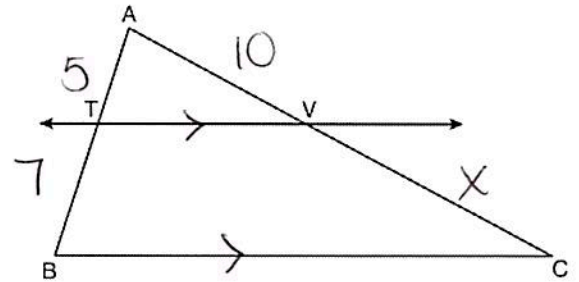
3. In the diagram below of $\triangle ABC$, $\overline{TV} \parallel \overline{BC}$, $AT = 5$, $TB = 7$, and $AV = 10$. What is the length of \overline{VC} ?

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

$$70 = 5x$$

$$x = 14$$

$$\overline{VC} = 14$$



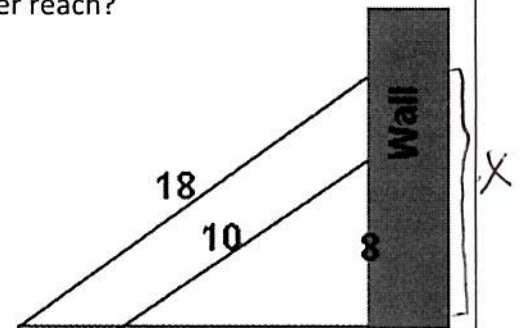
4. Two ladders are leaned against a wall such that they make the same angle with the ground. The 10' ladder reaches 8' up the wall. How much further up the wall does the 18' ladder reach?

$$\frac{8}{10} = \frac{x}{18}$$

$$144 = 10x$$

$$x = 14.4$$

$$14.4 - 8 = 6.4'$$



~~* repeat *~~

5. The map at the right shows the walking paths at a local park. The garden walkway is parallel to the walkway between the monument and the pond. How long is the path from the pond to the playground?

$$\frac{60}{24} = \frac{2x+10}{x}$$

$$60x = 24(2x+10)$$

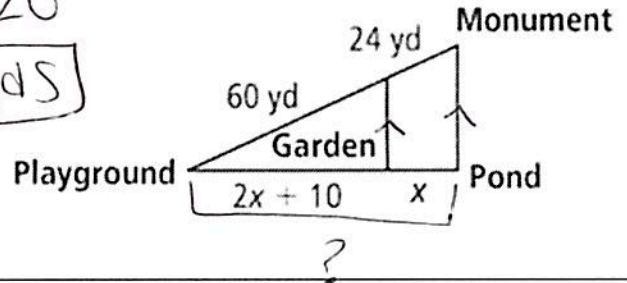
$$60x = 48x + 240$$

$$12x = 240$$

$$x = 20$$

$$2(20) + 10 + 20$$

$$\boxed{70 \text{ yds}}$$

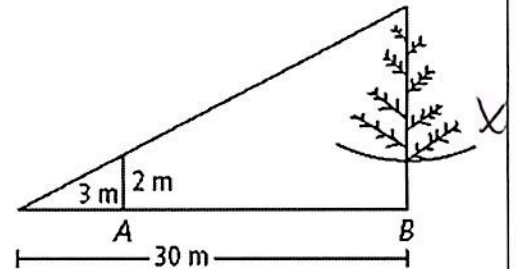


6. A stick 2m long is placed vertically at point B. The top of the stick is in line with the top of a tree as seen from point A, which is 3 m from the stick and 30 m from the tree. How tall is the tree?

$$\frac{3}{2} = \frac{30}{x}$$

$$3x = 60$$

$$\boxed{x = 20 \text{ m}}$$



7. 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} ?

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

OR

$$\frac{10}{2} = \frac{x+12}{x}$$

$$10x = 2(x+12)$$

$$10x = 2x + 24$$

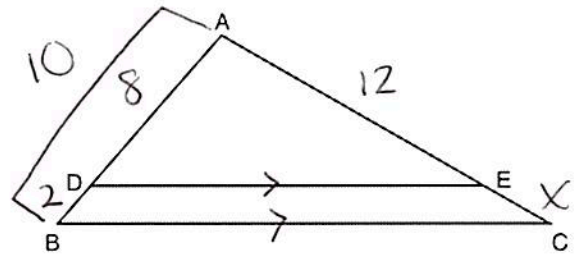
$$8x = 24$$

$$\boxed{x = 3}$$

$$24 = 8x$$

$$x = 3$$

$$\boxed{EC = 3}$$



8. 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 $AE = 3$, $ED = 6$, and $DC = 15$, find the length of \overline{EB} .

$$\frac{3}{9} = \frac{x}{15}$$

$$45 = 9x$$

$$x = 5$$

$$\boxed{EB = 5}$$

