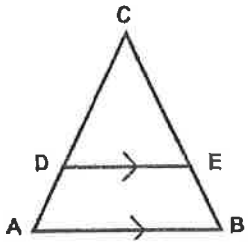
# PARALLEL LINES AND PROPORTIONAL PARTS NOTES

**Triangle Proportionality:** If a line is parallel to one side of a triangle then it separates these sides into segments of proportional length.

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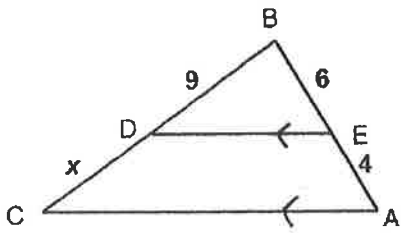
Examples: Find x for each triangle.

1.

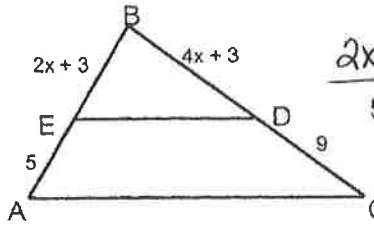



$\frac{6}{4} = \frac{9}{x}$

$36 = 6x$

$\boxed{x = 6}$

2.




$\frac{2x+3}{5} = \frac{4x+3}{9}$

$18x + 27 = 20x + 15$

$12 = 2x$

$\boxed{x = 6}$

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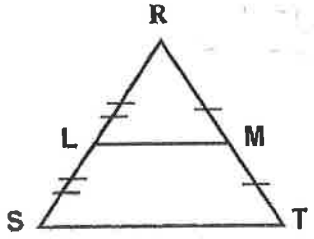
**Triangle Midsegment Theorem:** A segment that joins the midpoints of two sides of a triangle is half the length of the third side.

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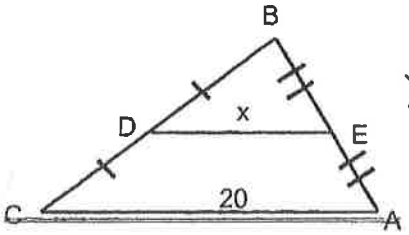
Examples: Find x for each triangle.

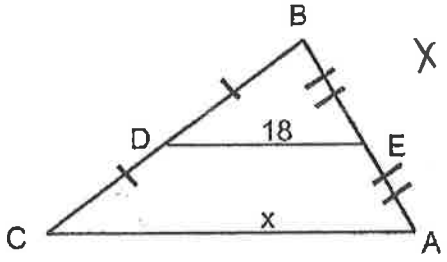
3.




$x = \frac{20}{2}$

$x = 10$

4.



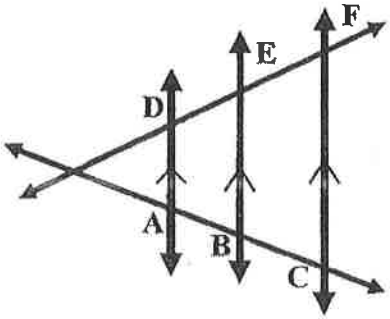

$x = 18 \cdot 2$

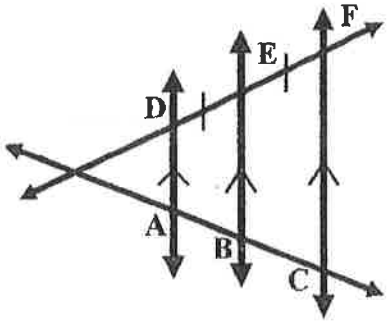
$x = 36$

# PARALLEL LINES AND PROPORTIONAL PARTS NOTES

Proportional Parts: If three or more parallel lines have two transversals then they cut off the transversals proportionally.

Proportional Parts: If three or more parallel lines cut off congruent segments on one transversal then they cut off congruent segments on every transversal.

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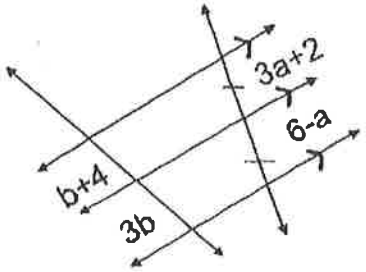
Examples: Find the value of each variable.

5.




$3a+2 = 6-a$

$4a = 4$

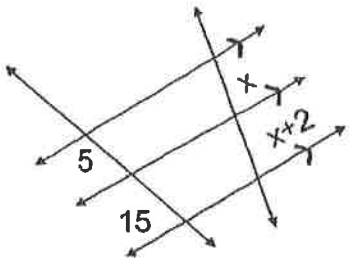
$\boxed{a=1}$

$b+4 = 3b$

$4 = 2b$

$\boxed{b=2}$

6.




$\frac{5}{15} = \frac{x}{x+2}$

$5x+10 = 15x$

$10 = 10x$

$\boxed{x=1}$