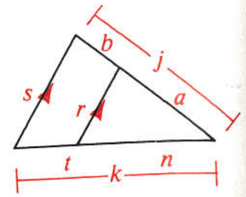
Written Exercises

A 1. Tell whether the proportion is correct.

a. $\frac{r}{s} = \frac{a}{b}$ b. $\frac{j}{a} = \frac{s}{r}$ c. $\frac{a}{b} = \frac{n}{t}$

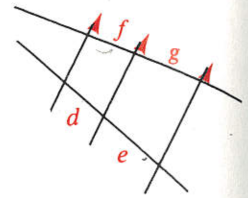
d. $\frac{t}{k} = \frac{a}{j}$ e. $\frac{r}{s} = \frac{n}{k}$ f. $\frac{b}{j} = \frac{t}{k}$



2. Tell whether the proportion is correct.

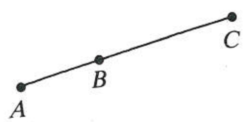
a. $\frac{d}{f} = \frac{g}{e}$ b. $\frac{f}{g} = \frac{e}{d}$

c. $\frac{g}{f} = \frac{e}{d}$ d. $\frac{d}{f} = \frac{e}{g}$



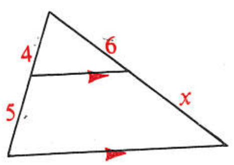
In Exercises 3–6, $\frac{AB}{BC} = \frac{3}{5}$. Copy and complete the table.

	3.	4.	5.	6.
AB	6	?	?	?
BC	?	25	?	?
AC	?	?	56	100



Find the value of *x*.

7.



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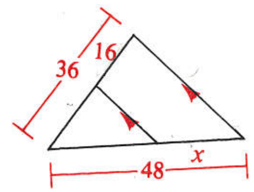
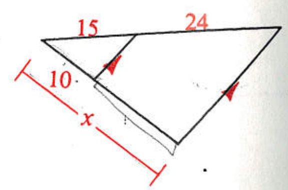


9.



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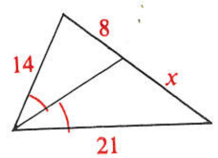

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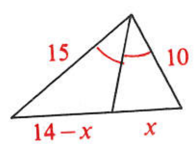
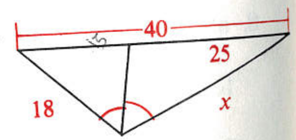
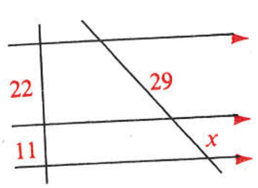


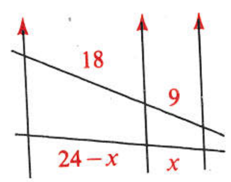
12.



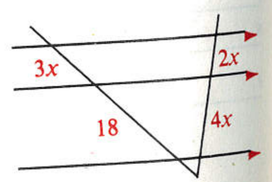
13.



14.

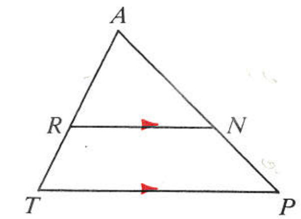


15.



Copy the table and fill in as many spaces *as possible*. It may help to draw a new sketch for each exercise and label lengths as you find them.

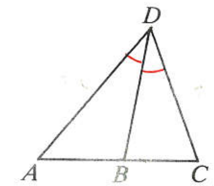
	AR	***RT***	***AT***	***AN***	***NP***	***AP***	***RN***	***TP***
B 16.	6	4	?	9	?	?	?	15
17.	?	?	?	?	6	16	?	?
18.	18	?	?	?	?	?	30	40
19.	12	?	20	?	?	30	15	?
20.	18	?	?	26	?	?	24	36
21.	?	?	33	24	20	?	?	50



22. Prove the corollary to the Triangle Proportionality Theorem.

23. Prove the Triangle Angle-Bisector Theorem.

Complete.



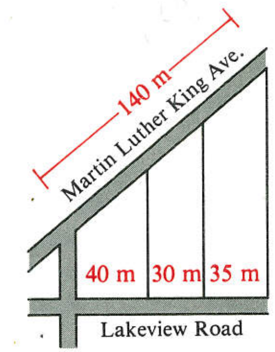
24. $AD = 21$, $DC = 14$, $AC = 25$, $AB =$ _?_

25. $AC = 60$, $CD = 30$, $AD = 50$, $BC =$ _?_

26. $AB = 27$, $BC = x$, $CD = \frac{4}{3}x$, $AD = x$, $AC =$ _?_

27. $AB = 2x - 12$, $BC = x$, $CD = x + 5$, $AD = 2x - 4$, $AC =$ _?_

28. Three lots with parallel side boundaries extend from the avenue to the road as shown. Find, to the nearest tenth of a meter, the frontages of the lots on Martin Luther King Avenue.



Ex. 28

29. The lengths of the sides of $\triangle ABC$ are $BC = 12$, $CA = 13$, and $AB = 14$. If M is the midpoint of $\overline{CA}$, and P is the point where $\overline{CA}$ is cut by the bisector of $\angle B$, find MP.

30. Prove: If a line bisects both an angle of a triangle and the opposite side, then the triangle is isosceles.

C 31. Discover and prove a theorem, about planes and transversals, suggested by the corollary to the Triangle Proportionality Theorem.

32. Prove that there cannot be a triangle in which the trisectors of an angle also trisect the opposite side.

33. Can there exist a $\triangle ROS$ in which the trisectors of $\angle O$ intersect $\overline{RS}$ at D and E, with $RD = 1$, $DE = 2$, and $ES = 4$? Explain.

34. Angle E of $\triangle ZEN$ is obtuse. The bisector of $\angle E$ intersects $\overline{ZN}$ at X. J and K lie on $\overline{ZE}$ and $\overline{NE}$ with $ZJ = ZX$ and $NK = NX$. Discover and prove something about quadrilateral $ZNKJ$.