

MINISTRY OF EDUCATION	MATHEMATICS
BADAA AL MUTAWA SCHOOL	Similarity & Midsegments
Student Name: _____	Grade: _____
Date: _____	Teacher: Abdulkader Amro

MATHEMATICS MULTIPLE-CHOICE ASSESSMENT-M3L5 – Triangle Proportionality

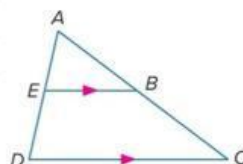
Parallel Lines, Proportional Segments & Triangle Midsegments

Instructions: Choose the one correct answer for each question. Show your work where appropriate. Use the diagram information stated in each question.

PROPORTIONAL SEGMENTS & PARALLEL LINES

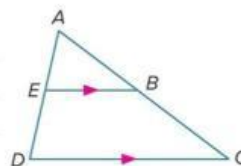
1. If $AB = 6$, $BC = 4$, and $AE = 9$, find ED . (EB is parallel to DC .)

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|-------------|--------------|
| A. 5 | B. 6 |
| C. 8 | D. 12 |



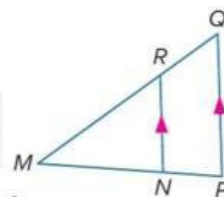
2. If $AB = 12$, $AC = 16$, and $ED = 5$, find AE . (EB is parallel to DC .)

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|--------------|--------------|
| A. 10 | B. 12 |
| C. 15 | D. 20 |



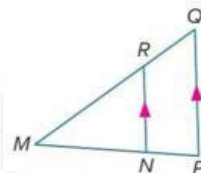
3. Determine whether $NR \parallel PQ$. Given $PM = 18$, $PN = 6$, $QM = 24$, and $RM = 16$.

- | | |
|---|---|
| A. Yes; $RM/QM = PN/PM = 2/3$ | B. Yes; $RM/QM = PN/PM = 3/4$ |
| C. No; $RM/QM = 2/3$ but $PN/PM = 1/3$ | D. No; $RM/QM = 3/2$ but $PN/PM = 2/3$ |



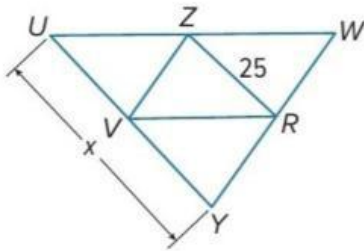
4. Determine whether $NR \parallel PQ$. Given $QM = 31$, $RM = 21$, and $PM = 4PN$.

- | | |
|---|---|
| A. Yes; both relevant ratios equal $4/5$ | B. Yes; both relevant ratios equal $21/31$ |
| C. No; $RM/QM = 21/31$, while $PN/PM = 1/5$ | D. No; $RM/QM = 21/31$, while $MN/MP = 4/5$ |



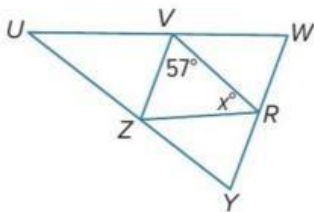
TRIANGLE MIDSEGMENTS

5. In $\triangle UWY$, VR , VZ , and ZR are midsegments. If $ZR = 25$ and x represents UY , find x .



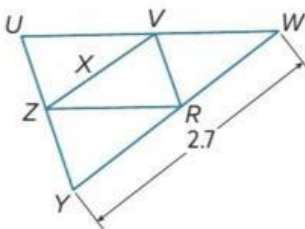
- | | |
|-------|-------|
| A. 25 | B. 40 |
| C. 50 | D. 75 |

6. In $\triangle UWY$, VR , VZ , and ZR are midsegments. The diagram gives $\angle ZVR = 57^\circ$. The angle x is $\angle VRZ$. What can be concluded from the information shown?



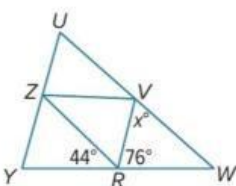
- | | |
|--------------------|--------------------------------------|
| A. $x = 33^\circ$ | B. $x = 57^\circ$ |
| C. $x = 123^\circ$ | D. x cannot be determined uniquely |

7. In $\triangle UWY$, VR , VZ , and ZR are midsegments. If $YW = 2.7$ and x represents ZV , find x .



- | | |
|---------|---------|
| A. 1.35 | B. 2.7 |
| C. 5.4 | D. 0.75 |

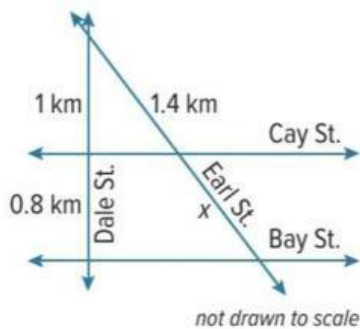
8. In $\triangle UWY$, VR , VZ , and ZR are midsegments. The diagram shows $\angle YRV = 76^\circ$ and $x = \angle RVW$. Find x .



- | | |
|----------------|----------------|
| A. 44° | B. 76° |
| C. 104° | D. 114° |

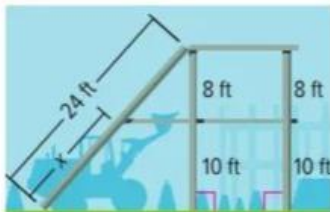
APPLICATIONS OF SIMILARITY

9. Cay Street and Bay Street are parallel. Along Earl Street, the distance from the upper point to Cay Street is 1.4 km. The perpendicular distance from the upper point to Cay Street is 1 km, and the distance between Cay Street and Bay Street is 0.8 km. Find x , the distance from Cay Street to Bay Street along Earl Street.



- | | |
|------------|------------|
| A. 0.80 km | B. 1.00 km |
| C. 1.12 km | D. 1.40 km |

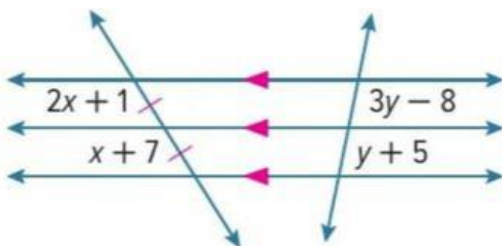
10. A two-story playscape has a vertical height of 18 ft (10 ft + 8 ft). A slanted support from the ground to the top is 24 ft long. If x is the slanted distance from the ground to the 10-ft level, find x .



- | | |
|------------|----------|
| A. 10.7 ft | B. 12 ft |
| C. 13.3 ft | D. 16 ft |

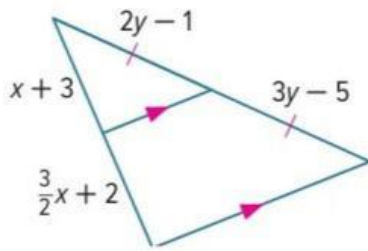
PARALLEL LINES & PROPORTIONS

11. Three parallel horizontal lines are cut by two transversals. The two consecutive segments on the left are marked congruent: $2x + 1$ and $x + 7$. The corresponding segments on the right are $3y - 8$ and $y + 5$. Find x and y .



- | | |
|-------------------|-------------------|
| A. $x = 5, y = 5$ | B. $x = 6, y = 6$ |
| C. $x = 7, y = 7$ | D. $x = 8, y = 8$ |

12. In the diagram, an interior segment is parallel to the triangle's bottom side. The two segments on the upper slanted side are marked congruent and have lengths $2y - 1$ and $3y - 5$. The two segments on the left side are $x + 3$ and $\frac{3}{2}x + 2$. Find x and y .



A. $x = 2, y = 2$

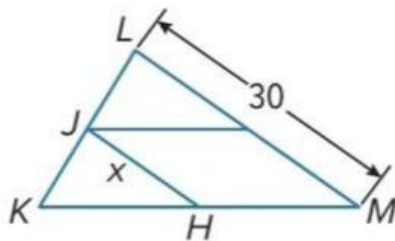
B. $x = 4, y = 2$

C. $x = 2, y = 4$

D. $x = 4, y = 4$

MIXED EXERCISES: MIDSEGMENTS

13. JH is a midsegment of $\triangle KLM$. If $LM = 30$ and x represents JH , find x .



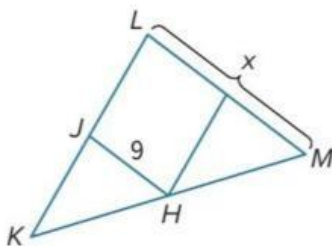
A. 10

B. 12

C. 15

D. 30

14. JH is a midsegment of $\triangle KLM$. If $JH = 9$ and x represents the corresponding half of LM shown in the diagram, find x .



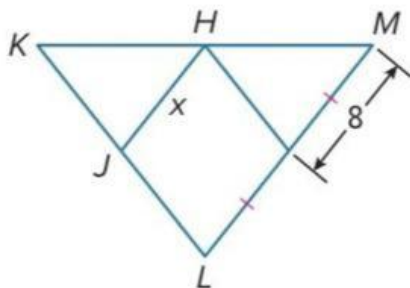
A. 4.5

B. 9

C. 18

D. 27

15. JH is a midsegment of $\triangle KLM$. The side LM is divided into two congruent segments, and the upper segment is 8. If x represents JH , find x .



- A. 4
C. 12

- B. 8
D. 16

16. In $\triangle ABC$, DE is parallel to AC and $DE = 10$. If DE is a midsegment of $\triangle ABC$, find the length of AC .

- A. 5
C. 15

- B. 10
D. 20

17. CARPENTRY: Jake is fixing an A-frame. The base is 24 ft wide. He wants to add a horizontal support beam halfway up and parallel to the ground. How long should this beam be?



- A. 6 ft
C. 12 ft

- B. 10 ft
D. 18 ft