Name _____ Class _____ Date _____

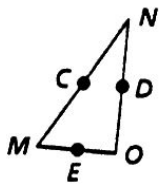
Practice 5-1

Midsegments of Triangles

Use the diagrams at the right to complete the exercises.

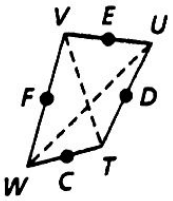
1. In $\triangle MNO$, the points C, D, and E are midpoints. $CD = 4$ cm, $CE = 8$ cm, and $DE = 7$ cm.

   a. Find MO. **b.** Find NO. **c.** Find MN.



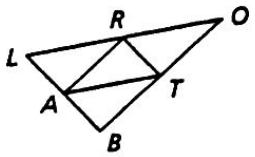
2. In quadrilateral $WVUT$, the points F, E, D, and C are midpoints. $WU = 45$ in. and $TV = 31$ in.

   a. Find CD. **b.** Find CF. **c.** Find ED.



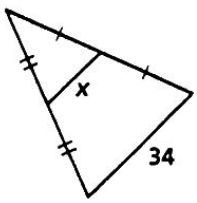
3. In $\triangle LOB$, the points A, R, and T are midpoints. $LB = 19$ cm, $LO = 35$ cm, and $OB = 29$ cm.

   a. Find RT. **b.** Find AT. **c.** Find AR.



Find the value of the variable.

4.



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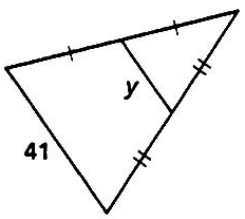

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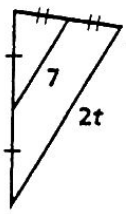
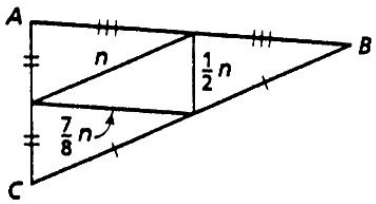


7. Perimeter of $\triangle ABC = 32$ cm



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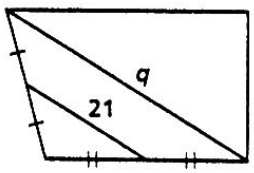

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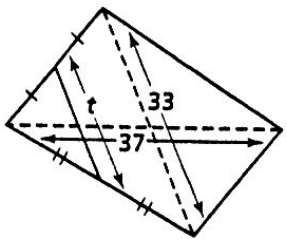
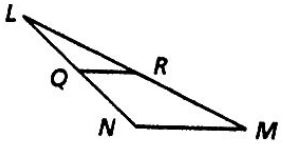


10. $\overline{QR}$ is a midsegment of $\triangle LMN$.

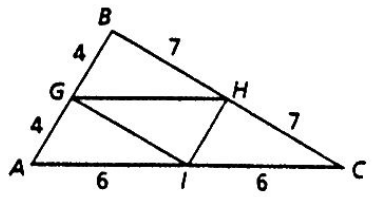
    a. $QR = 9$. Find NM.

    b. $LN = 12$ and $LM = 31$. Find the perimeter of $\triangle LMN$.

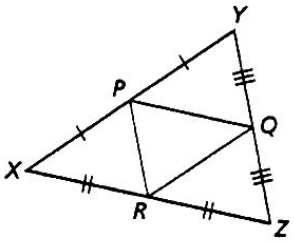


Use the given measures to identify three pairs of parallel segments in each diagram.

11.



12.



Solving Quadratic Equations by Using the Quadratic Formula

The method of completing the square can be used to develop a general formula called the *quadratic formula* that can be used to solve any quadratic equation.

The Quadratic Formula

The roots of a quadratic equation of the form $ax^2 + bx + c = 0$, where $a \neq 0$, are given by the formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}.$$

In order to find a real value for $\sqrt{b^2 - 4ac}$, the value of $b^2 - 4ac$ must be nonnegative. If $b^2 - 4ac$ is negative, the equation has no real roots.

Example: Use the quadratic formula to solve $x^2 - 6x - 2 = 0$.

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$= \frac{6 \pm \sqrt{(-6)^2 - 4(1)(-2)}}{2(1)} \qquad a = 1,\ b = -6, \text{ and } c = -2$$

$$= \frac{6 \pm \sqrt{44}}{2}$$

$x \approx 6.32$ or $x \approx 1.78$

The two roots are approximately 6.32 and 1.78.

Solve each equation by using the quadratic formula. Approximate irrational roots to the nearest hundredth.

1. $4t^2 = 144$

2. $2x^2 + 9x + 4 = 0$

3. $8x^2 + 17x + 2 = 0$

4. $3z^2 + 5z - 2 = 0$

5. $-2m^2 + 8m + 4 = 0$

6. $x^2 + 3x - 2 = 0$

7. $2x^2 - 6x + 4 = 0$

8. $5x^2 + 10 = 15$

9. $2y^2 - 9y - 3 = 0$