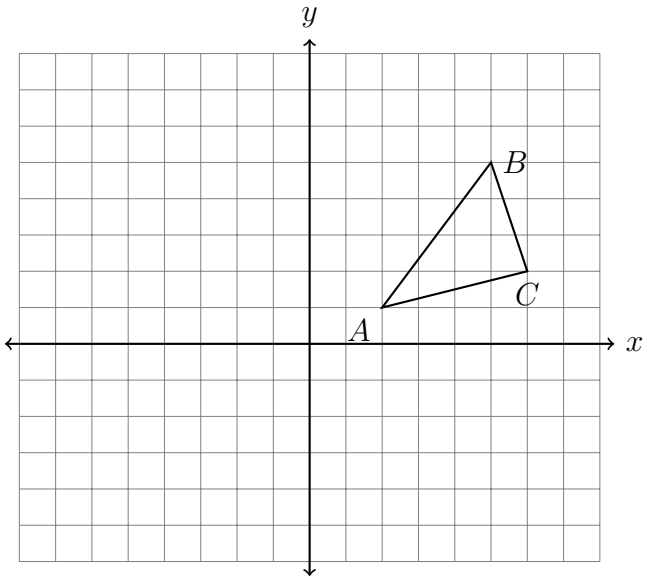
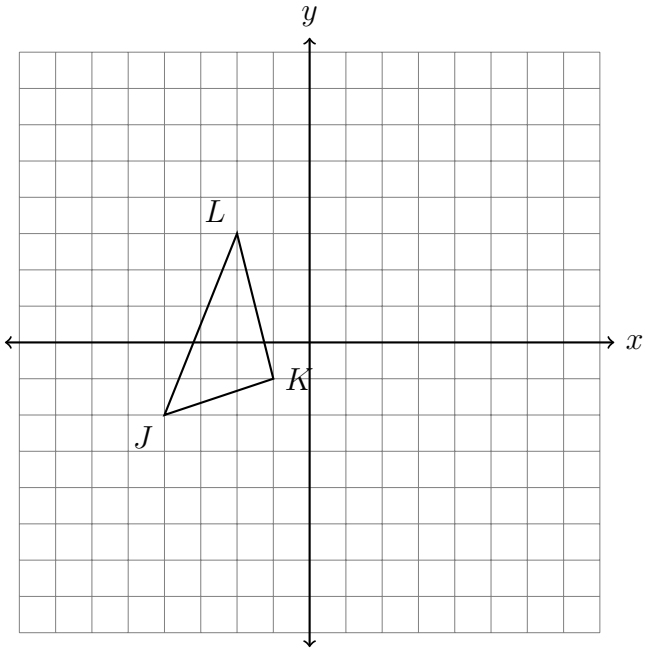
5.9 Pre-Exam: Transformations, parallels, volume; angle relationships

1. Apply a rotation of 90° centered at the origin to $\triangle ABC$. Plot and label the image on the axes below and make a table of its coordinates.

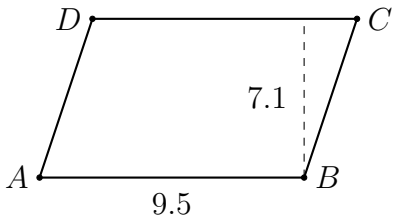


2. The vertices of $\triangle JKL$ have the coordinates $J(-4,-2)$, $K(-1,-1)$, and $L(-2,3)$, as shown below.

   Apply a translation of $(x,y) \to (x-3, y+2)$ to $\triangle JKL$ and then reflect the image across the y-axis. Draw both images $\triangle J'K'L'$ and $\triangle J''K''L''$ on the set of axes below, labeling the vertices.

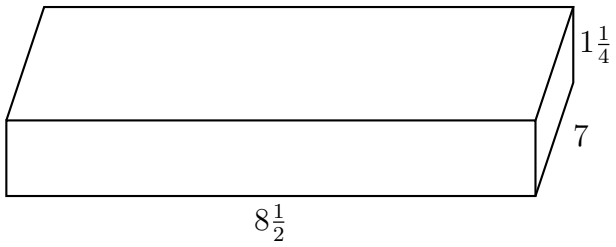


3. Find the area of the parallelogram $ABCD$ shown below, with $AB = 9.5$ and height $h = 7.1$.



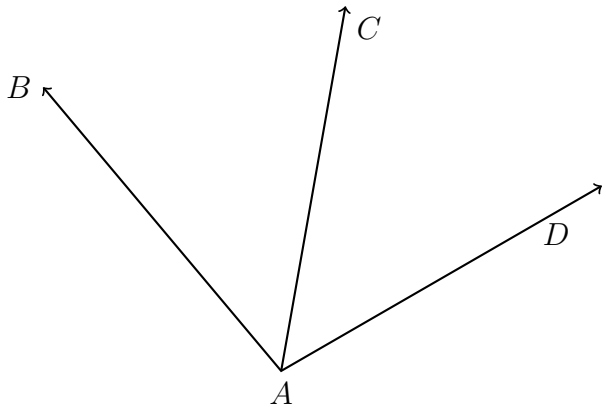
4. Find the sum of the measures of the internal angles of a hexagon. Show the formula.

5. A wooden cutting board is $8\frac{1}{2}$ inches long, 7 inches wide, and $1\frac{1}{4}$ inches thick. Find the volume of the box. Show the calculation.

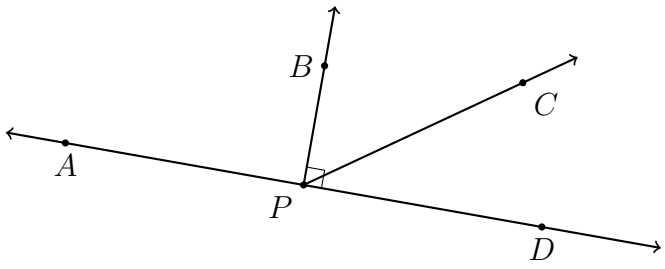


6. Of two complementary angles, the measure of $\angle A$ is two times that of $\angle B$. Find $m\angle A$.

7. An angle bisector is shown below, with $\overrightarrow{AC}$ bisecting $\angle BAD$. Given $m\angle BAC = 6x-5$ and $m\angle BAD = 9x+17$, find $m\angle BAD$. (Show check)

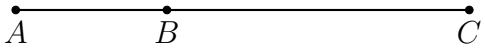


8. Angles APC and CPD form a linear pair. $m\angle APC = 10x-10$ and $m\angle CPD = 3x-5$. Find $m\angle CPD$. Check your answer for full credit.

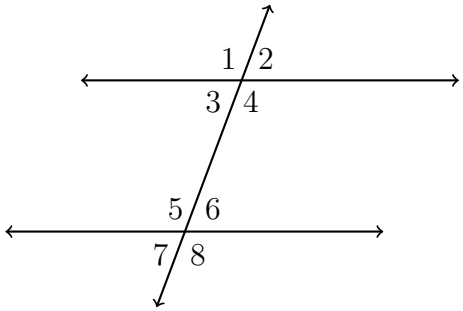


Do Not Solve!
Model the situation with an equation in terms of x.

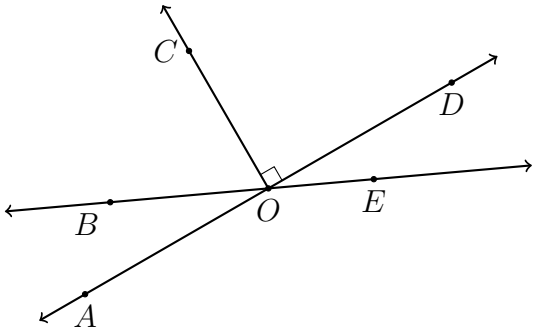
9. Given $\overline{ABC}$, with $AB = 2x - 1$, $BC = 3x + 7$, and $AC = 21$. Find x.



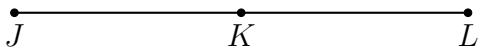
10. Given $m\angle 3 = x + 35$ and $m\angle 5 = 4x - 25$. Find x.



11. In the diagram below $m\angle AOB = 6x + 5$ and $m\angle COB = 8x + 15$. Find x.

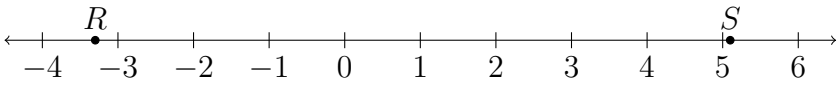


12. The point K is the midpoint of $\overline{JL}$, $JK = 3x + 15$, and $JL = 9x + 9$. Find x.



13. The measures in degrees of the three angles of a triangle are $3x$, $\frac{1}{2}x + 7$, and $5x - 65$. Find x.

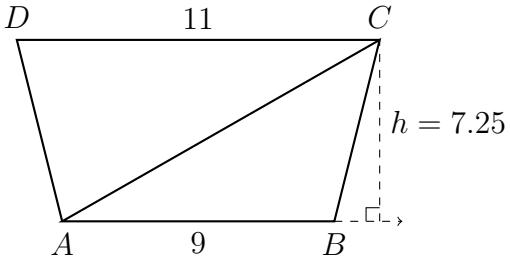
14. Given $\overleftrightarrow{RS}$ as shown on the number line, with $R = -3.3$ and $S = 5.1$.



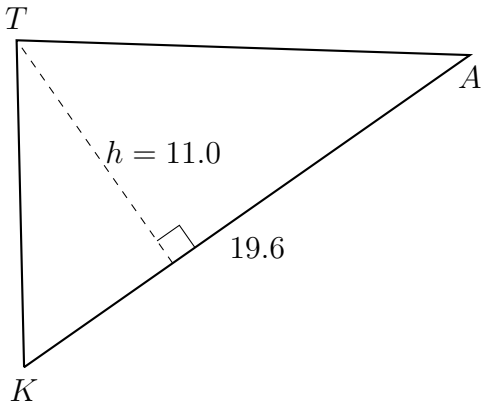
(a) What is the exact distance on the number line between the points R and S?

(b) The point T bisects $\overline{RS}$. Find the value of T, and mark and label it on the numberline $\overleftrightarrow{RS}$ shown above.

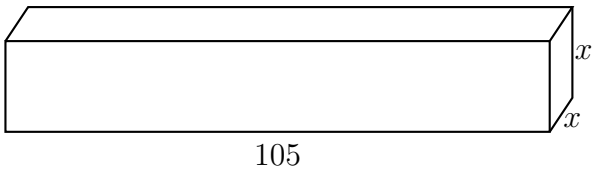
15. The trapezoid $ABCD$ has two parallel sides, $\overline{AB} \parallel \overline{CD}$ with lengths $AB = 9$ and $CD = 11$. The trapezoid's height is $h = 7.25$. Find the area of the trapezoid.



16. Find the area of $\triangle KAT$. The altitude h of the triangle is 11.0 centimeters and the base $KA = 19.6$ cm. Show work by writing an equation before making the calculation.

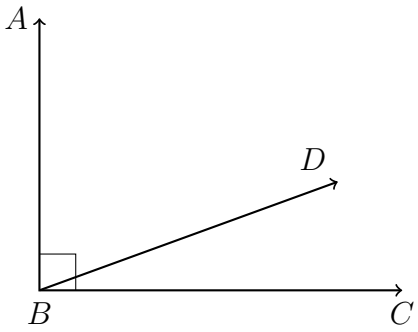

T
A
h = 11.0
19.6
K

17. A feeding trough in the shape of a rectangular prism is 105 inches long. The trough's cross section is square. If its volume is 15,120 cubic inches, what is the dimension of each side of its square end, x? (drawing not to scale)

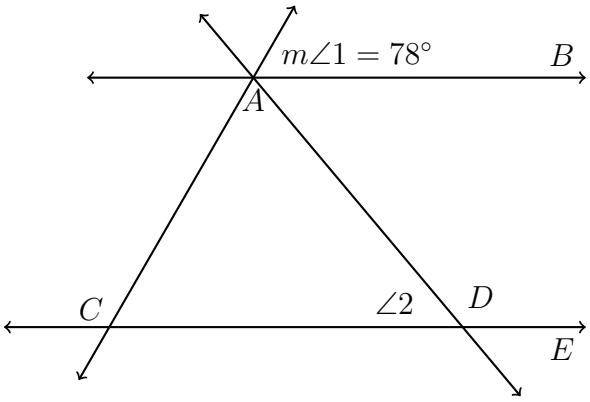


18. Given $\overrightarrow{BA} \perp \overrightarrow{BC}$, $m\angle ABD = 2x$, and $m\angle DBC = x - 15$. Find $m\angle DBC$.

    For full credit, show the check using both angle measures.



19. Given parallel lines $\overleftrightarrow{AB} \parallel \overleftrightarrow{CDE}$ with $\overline{AD} \cong \overline{CD}$. If $m\angle 1 = 78$ find $m\angle 2$.



20. The volume of the rectanglar prism shown is 120 cubic feet. Its length is length is ten feet longer than its height x. Its depth is 5 feet. Find the length of the prism. (not drawn to scale)