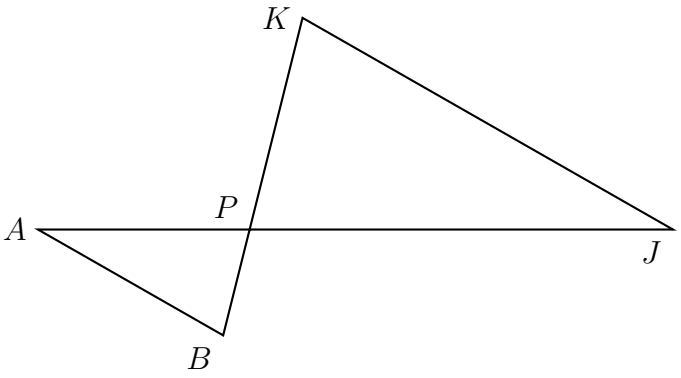
R13.1 Congruence transformations

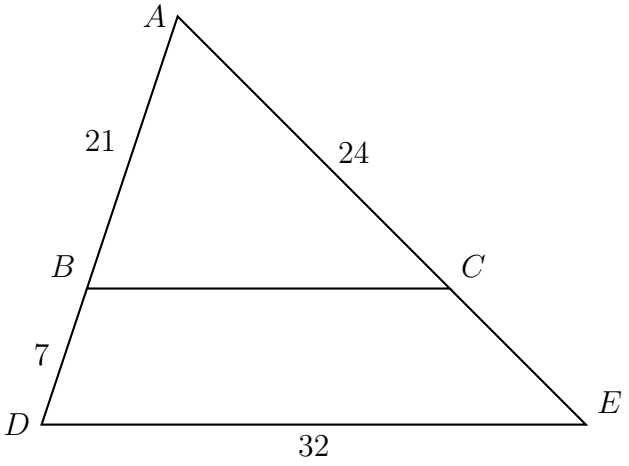
1. A pyramid-shaped container has a height of two feet and a square base measuring 16 inches on each side. Find the container's volume to the *nearest cubic inch*.

2. Given $\triangle ABP \sim \triangle JKP$ as shown below. $AB = 11.5$, $JK = 23.0$, and $AJ = 33$. Find JP.

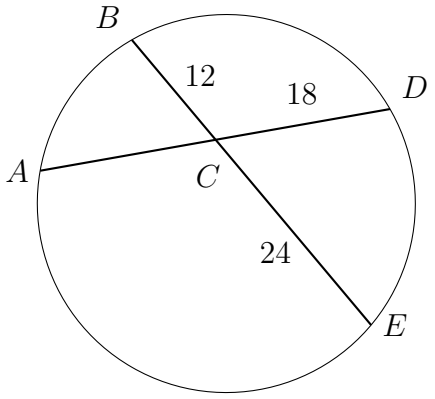


3. Write an equation of the line that is parallel to the line whose equation is $2y = 8 - x$ and passes through the point $(5, -1)$.

4. Triangle ABC is dilated with a scale factor of k centered at A, yielding $\triangle ADE$, as shown. Given $AB = 21$, $BD = 7$, $AC = 24$, and $DE = 32$. Find BC.



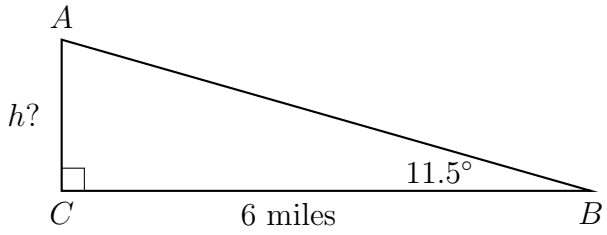
5. Circle O has chords $\overline{AD}$ and $\overline{BE}$ intersecting at C, as shown. Find AC.



6. Point P divides $\overline{AB}$ so that $AP : PB = 1 : 3$. If A has coordinates $(11, -1)$ and B has coordinates $(-1, 7)$, what are the coordinates of P?

7. From six miles away, the angle of elevation to a mountain peak is 11.5°. What is the height of the mountain above the observer, to the *nearest hundred feet*? (1 mile = 5280 feet)

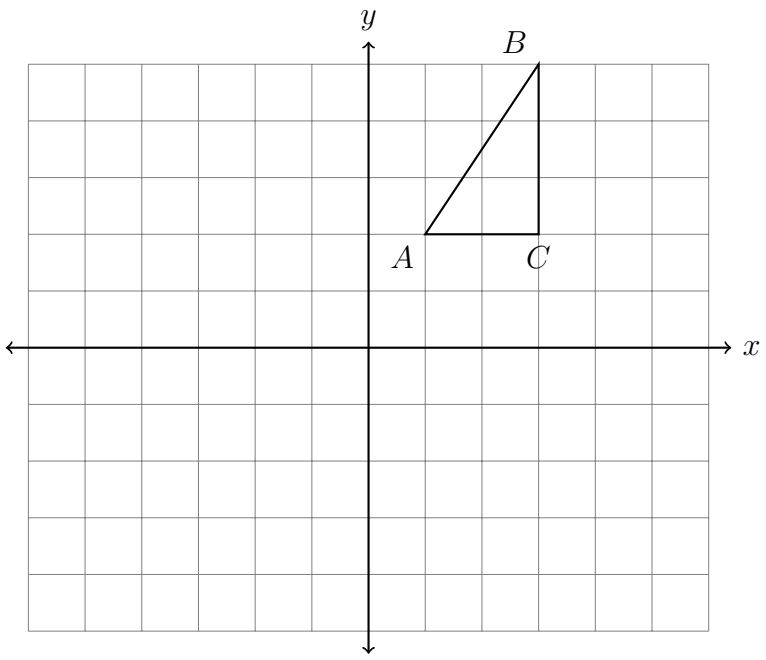
not to scale



8. If a rectangular sheet is continuously rotated around one of its longer edges, what is the three-dimensional figure formed?

(a) cone
(b) sphere
(c) cylinder
(d) rectangular prism

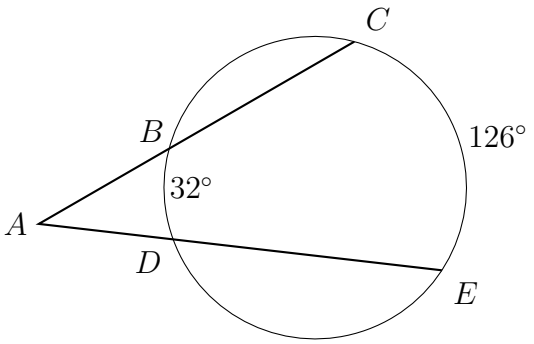
9. Rotate the triangle 90° clockwise around the origin, $\triangle ABC \to \triangle A'B'C'$. Plot and label the image on the grid.



10. What is an equation of the line that passes through the point $(1, -1)$ and is perpendicular to a line with equation $2x - y = 5$?

(a) $y - 1 = \frac{1}{2}(x + 1)$
(b) $y - 1 = -\frac{1}{2}(x + 1)$
(c) $y + 1 = \frac{1}{2}(x - 1)$
(d) $y + 1 = -\frac{1}{2}(x - 1)$

11. The secants $\overline{ABC}$ and $\overline{ADE}$ intersect the circle O, as shown in the diagram. Given $m\widehat{BD} = 32°$ and $m\widehat{CE} = 126°$.

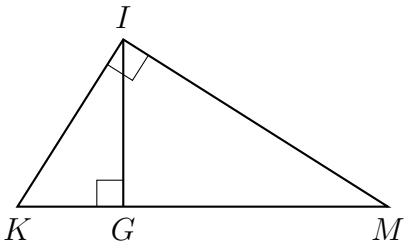


12. What is the equation of a circle with center $(3, -5)$ and radius $r = 4$?

13. The area of a sector of a circle with diameter measuring 8 cm is 1.60π cm^2. What is the measure of the central angle that forms the sector?

14. Find x such that for the angles of a right triangle, $\sin(5x + 5) = \cos(25)$.

15. In the diagram below of right triangle KMI, altitude $\overline{IG}$ is drawn to hypotenuse $\overline{KM}$. If $KG = 6$ and $GM = 24$, what is the length of $\overline{IG}$?



16. Translate $\triangle DEF$ by $(x, y) \to (x+3, y+1)$, then reflect the result over the x-axis. Label the images $\triangle D'E'F'$ and $\triangle D''E''F''$ respectively.