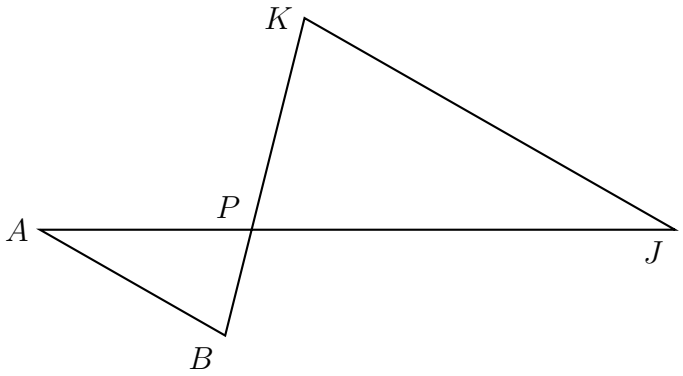
R13.1 Congruence transformations

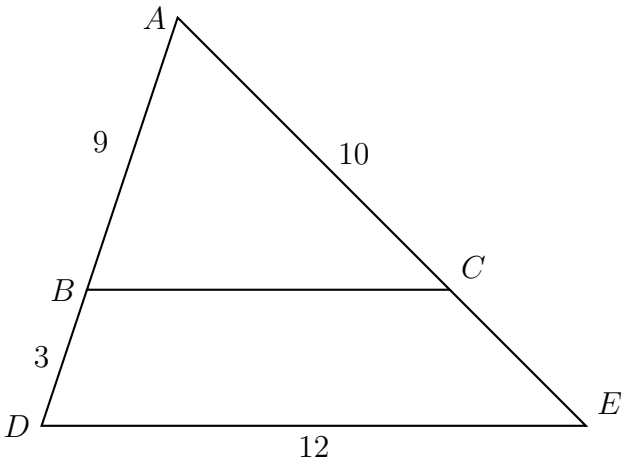
1. The base of a pyramid is a rectangle with a width of 11.2 cm and a length of 8.5 cm. What is the height, in centimeters, of the pyramid if its volume is 238 cm^3?

2. Given $\triangle ABP \sim \triangle JKP$ as shown below. $AB = 12.5$, $AP = 13.5$, $BP = 7.1$, and $JP = 32.4$. Find JK.

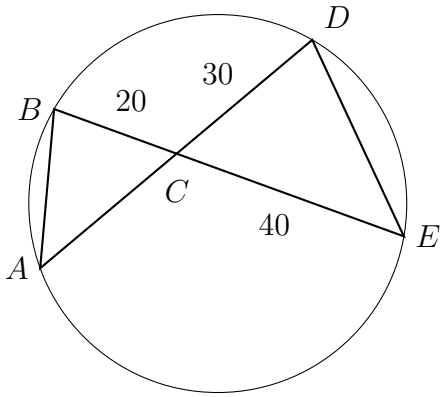


3. Write an equation of the line that is parallel to the line whose equation is $4y + 8 = 3x$ and passes through the point $(1, -3)$.

4. Triangle ABC is dilated with a scale factor of k centered at A, yielding $\triangle ADE$, as shown. Given $AB = 9$, $BD = 3$, $AC = 10$, and $DE = 12$. Find BC.



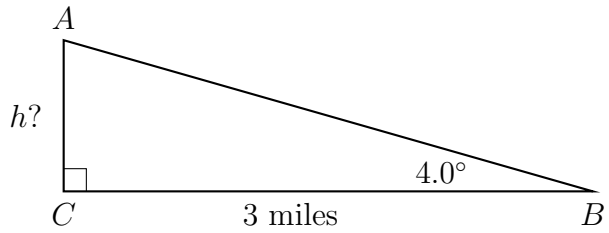
5. Circle O has chords $\overline{AD}$ and $\overline{BE}$ intersecting at C, as shown. Find AC.



6. Point M divides $\overline{AB}$ so that $AM : MB = 1 : 4$. If A has coordinates $(1, -1)$ and B has coordinates $(6, 9)$, what are the coordinates of M?

7. From three miles away, the angle of elevation to the top of a radio tower is $4.0°$. What is the height of the tower, to the *nearest ten feet*? (1 mile = 5280 feet)

not to scale



8. If a circular disk is continuously rotated around its diameter, what is the three-dimensional figure formed?

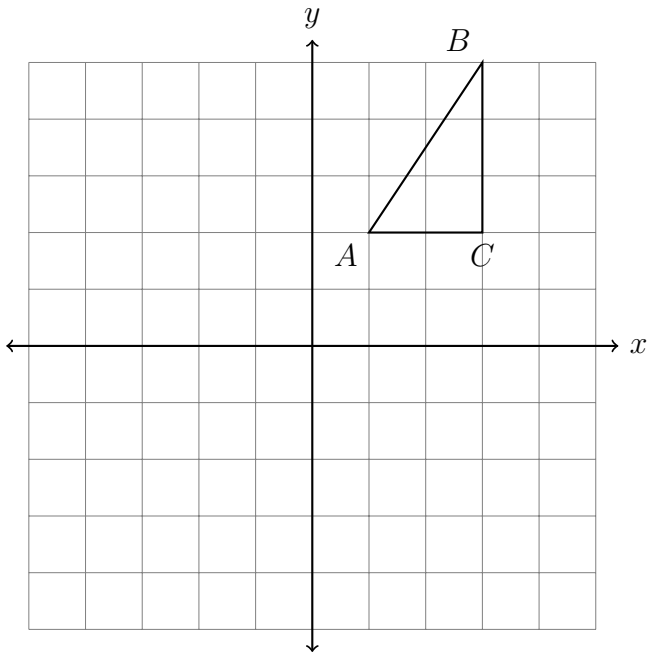
(a) cone
(b) sphere
(c) cylinder
(d) rectangular prism

9. Rotate the triangle 90° counterclockwise around the origin, $\triangle ABC \rightarrow \triangle A'B'C'$. Complete the table of the coordinates and plot and label the image on the grid.

$A(1,2) \rightarrow$

$B(3,5) \rightarrow$

$C(3,2) \rightarrow$



10. What is an equation of the line that passes through the point $(5,-2)$ and is perpendicular to a line with equation $y = \frac{3}{4}x + 5$?

(a) $y - 2 = \frac{4}{3}(x + 5)$

(b) $y - 2 = -\frac{4}{3}(x + 5)$

(c) $y + 2 = \frac{4}{3}(x - 5)$

(d) $y + 2 = -\frac{4}{3}(x - 5)$

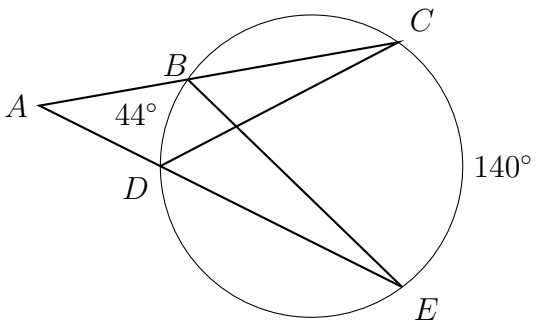
11. The secants $\overline{ABC}$ and $\overline{ADE}$ intersect the circle O, as shown in the diagram. Given $m\widehat{BD} = 44°$ and $m\widehat{CE} = 140°$.

(a) Find the $m\angle CDE$, $m\angle CBE$.

(b) Find the $m\angle C$, $m\angle E$.

(c) Find the $m\angle A$.

(d) Two similar triangles are shown. Write a similarity statement, listing the triangles' vertices in corresponding order.



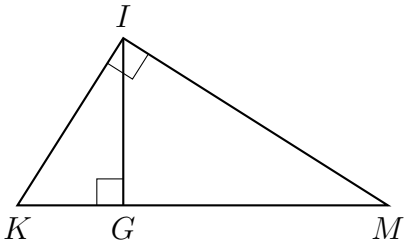
12. What is the equation of a circle with center $(4, -2)$ and radius $r = 5$?

13. The area of a sector of a circle with diameter measuring 10 cm is 3.75π cm^2. What is the measure of the central angle that forms the sector?

14. In a right triangle, the acute angles have the relationship $\sin(3x + 4) = \cos(37)$.

    What is the value of x?

15. In the diagram below of right triangle KMI, altitude $\overline{IG}$ is drawn to hypotenuse $\overline{KM}$.



    IF $KG = 4$ and $IG = 6$, what is the length of $\overline{IM}$?

16. Translate $\triangle DEF$ by $(x, y) \rightarrow (x + 5, y - 1)$, then reflect the result over the

x-axis. Label the images $\triangle D'E'F'$ and $\triangle D''E''F''$ respectively.