

8.4 Sectors, secants, & chords calculations

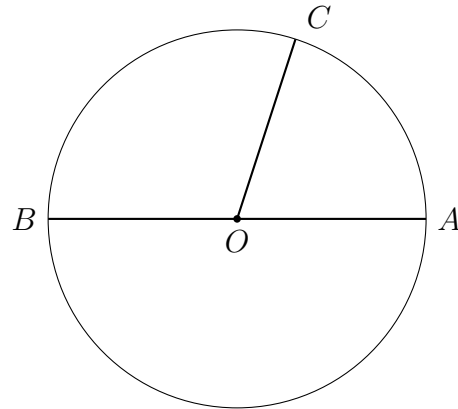
1. Do Now: Circle O has a diameter $AB = 10$, as shown. Given $m\angle AOC = 72^\circ$.

(a) Find the circumference of circle O .

(b) Find the area of circle O .

(c) Find the area of the sector AOC .

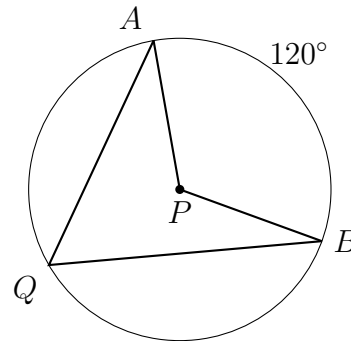
(d) Find the perimeter of sector AOC .



2. Given circle P with $m\widehat{AB} = 120^\circ$.

(a) Write down the $m\angle APB$.

(b) Find the $m\angle AQB$.



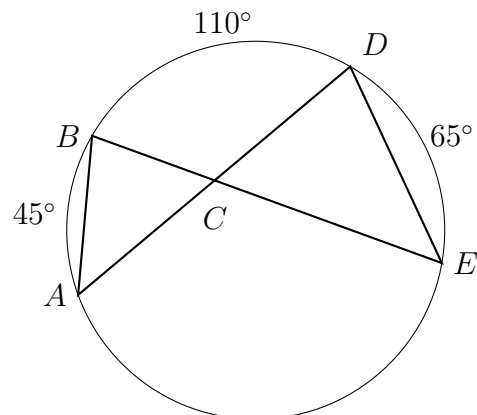
3. Given circle O with chords \overline{AD} and \overline{BE} intersecting at C , as shown in the diagram. Given $m\widehat{AB} = 45^\circ$, $m\widehat{BD} = 110^\circ$, and $m\widehat{DE} = 65^\circ$.

(a) Find the $m\angle BAD$.

(b) Find $m\widehat{AE}$

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

(d) Find the $m\angle ACB$.



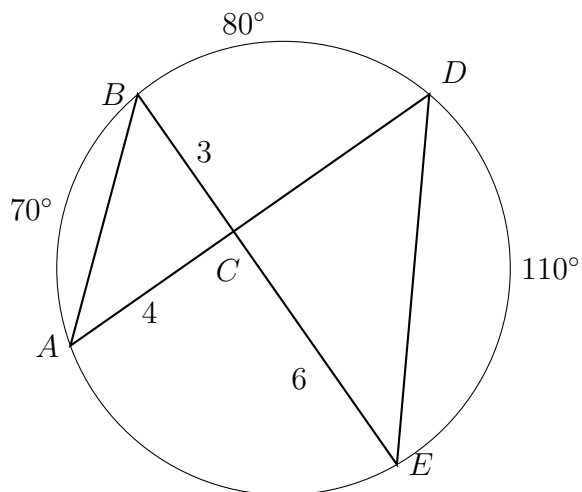
4. Given circle O with chords \overline{AD} and \overline{BE} intersecting at C , as shown in the diagram. Given $m\widehat{AB} = 70^\circ$, $m\widehat{BD} = 80^\circ$, and $m\widehat{DE} = 110^\circ$.

(a) Find the $m\angle BED$.

(b) Find the $m\angle ACB$.

(c) Given $AC = 4$ and $BC = 3$, find AB .

(d) Given $CE = 6$, find CD .

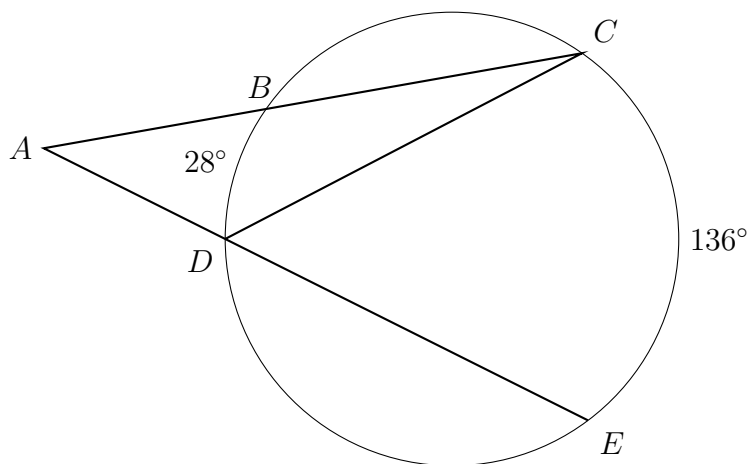


5. The secants \overline{ABC} and \overline{ADE} intersect the circle O , as shown in the diagram. Given $m\widehat{BD} = 28^\circ$ and $m\widehat{CE} = 136^\circ$.

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

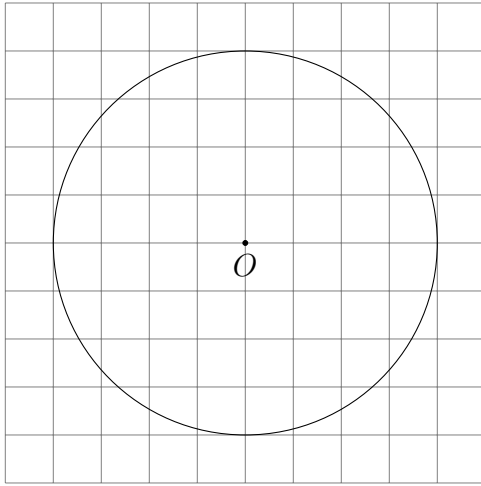
(b) Find the $m\angle BCD$.

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

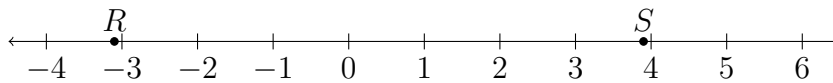


6. Given the circle O with circumference 8π .

- (a) Write down the formula for the circumference of a circle and solve for the radius yielding a circumference of 8π .
- (b) Find the area of the circle.



7. Given \overleftrightarrow{RS} as shown on the number line, with $R = -3.1$ and $S = 3.9$.

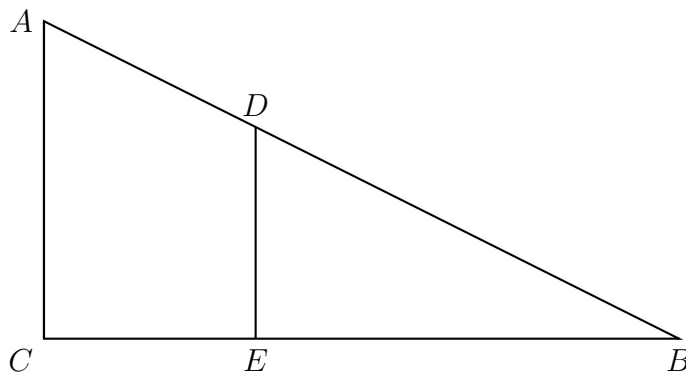


(a) What is the exact distance on the number line between the points R and S ?

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

9.10 Homework: Area and volume calculations

8. In right triangle ABC shown below, point D is on \overline{AB} and point E is on \overline{BC} such that $\overline{AC} \parallel \overline{DE}$. Given $BD = 10$, $BC = 12$, and $EC = 4$.



- (a) Find the length of \overline{BE} .
- (b) Find the scale factor, k , dilating $\triangle DBE \rightarrow \triangle ABC$, centered at B .
- (c) Find the area of $\triangle ABC$.
- (d) Find the area of $\triangle DEB$.
- (e) Find the ratio of the areas of the two triangles.

9. Find the area of a semi-circle radius of 7.

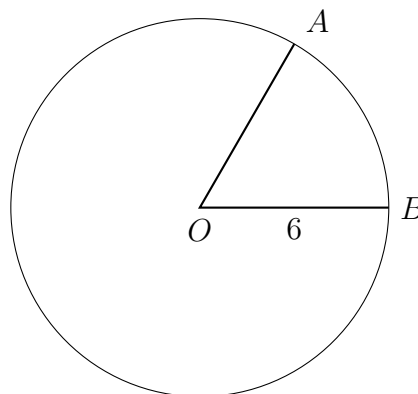
10. Given circle O with radius $OB = 6$.

(a) Find the circumference of circle O .

(b) Find its area.

(c) Given that $m\angle AOB = 60^\circ$, find $m\widehat{AB}$.

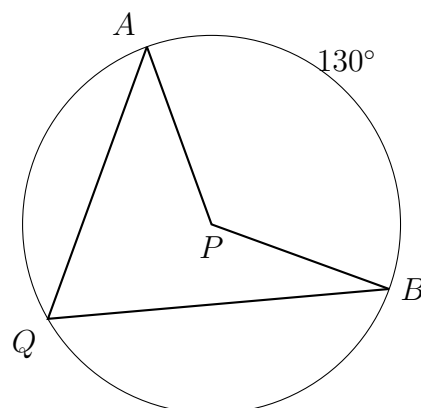
(d) Find the area of the sector AOB .



11. Given circle P with $m\widehat{AB} = 130^\circ$.

(a) Write down the $m\angle APB$.

(b) Find the $m\angle AQB$.



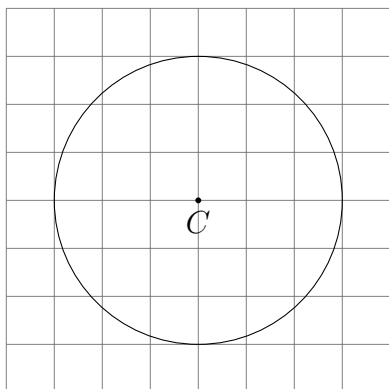
12. Find the volume of a pyramid ($V = \frac{1}{3}Bh$) having a height of 11.3 inches and with a square base having side lengths of 7 inches. Express your result to the *nearest cubic inch*.
13. Find the volume of a hemisphere with a radius of 30 inches, to the *nearest whole cubic inch*. (The formula for the volume of a *sphere* is $V = \frac{4}{3}\pi r^3$)
14. Given $R(-2, 0)$ and $S(3, 5)$, find the length of \overline{RS} . Simplify the radical.

9.8 Classwork: Analytical Geometry Practice

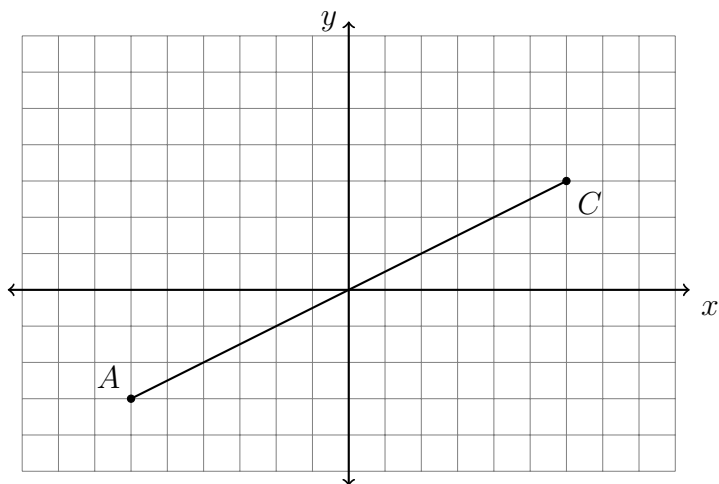
15. Given the circle C with circumference 10π .

(a) Write down the formula for the circumference of a circle and solve for the radius yielding a circumference of 6π .

(b) Find the area of the circle.



16. In the diagram below, \overline{AC} has endpoints with coordinates $A(-6, -3)$ and $C(6, 3)$.



If B is a point on \overline{AC} and $AB:BC = 1:3$, what are the coordinates of B ?

17. Write down the center and radius of each circle.

(a) $(x - 4)^2 + (y - 3)^2 = 9$

(c) $x^2 + y^2 = 4$

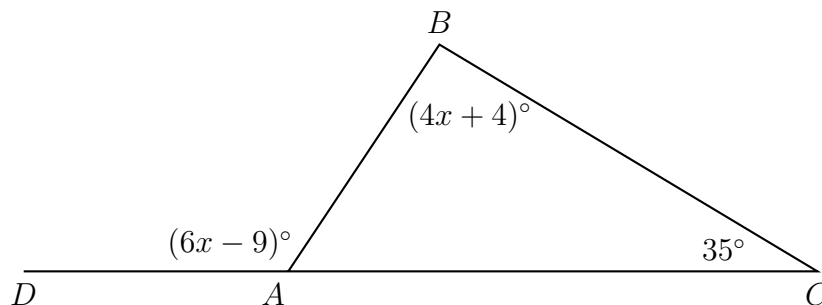
(b) $(x + 5)^2 + (y - 2)^2 = 4^2$

(d) $(x + 7)^2 + (y - 2)^2 = 9^2$

18. Find the volume of a cone ($V = \frac{1}{3}\pi r^2 h$) having a height of 12 inches and with a radius of 3 inches. Express your result to the *nearest cubic inch*.

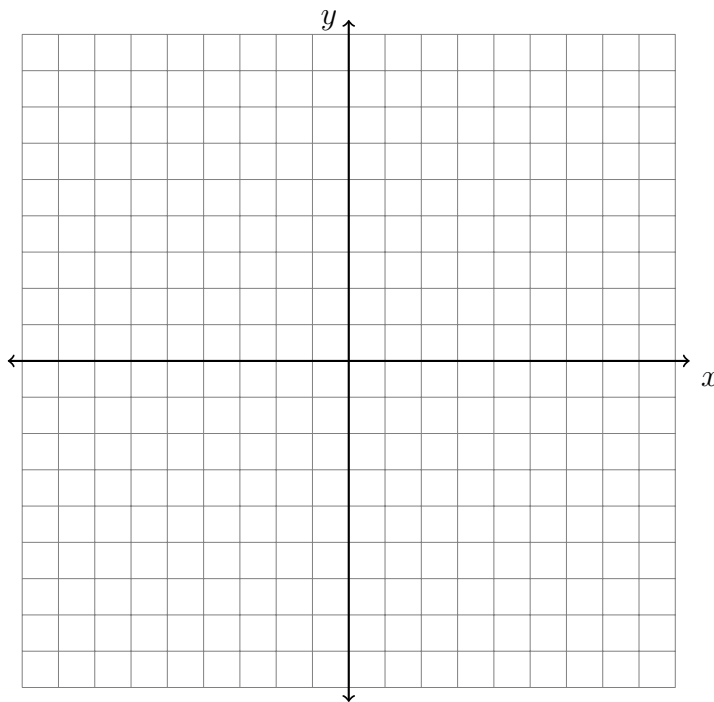
19. Find the volume of a cylinder 10 inches tall with a radius of 6 inches, to the *nearest whole cubic inch*. (The formula for the volume of a *cylinder* is $V = \frac{4}{3}\pi r^3$)

20. In $\triangle ABC$ shown below, side \overline{AC} is extended to point D with $m\angle DAB = (6x - 9)^\circ$, $m\angle C = 35^\circ$, and $m\angle B = (4x + 4)^\circ$.



What is $m\angle BAC$?

21. On the set of axes below, graph the quadrilateral $ABCD$ having coordinates $A(-3, -3)$, $B(5, 1)$, $C(6, 8)$, and $D(-2, 4)$.



Show that the midpoints of the two diagonals, \overline{AC} and \overline{BD} , are the same point.

Prove $ABCD$ is a parallelogram. Use the following theorem: A quadrilateral is a parallelogram if and only if its diagonals bisect each other.

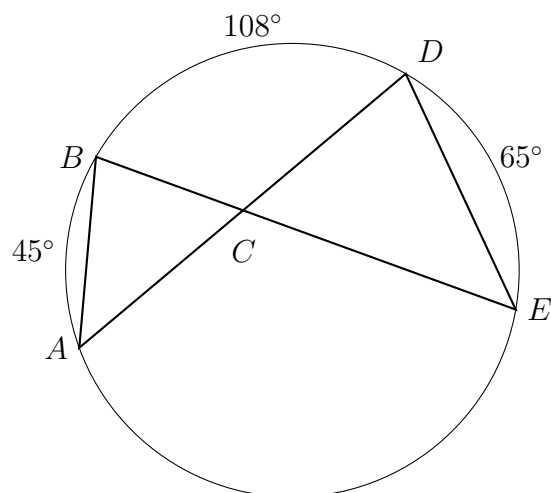
Be sure to state the conclusion in your proof.

9.8 Homework: Review Problem Set

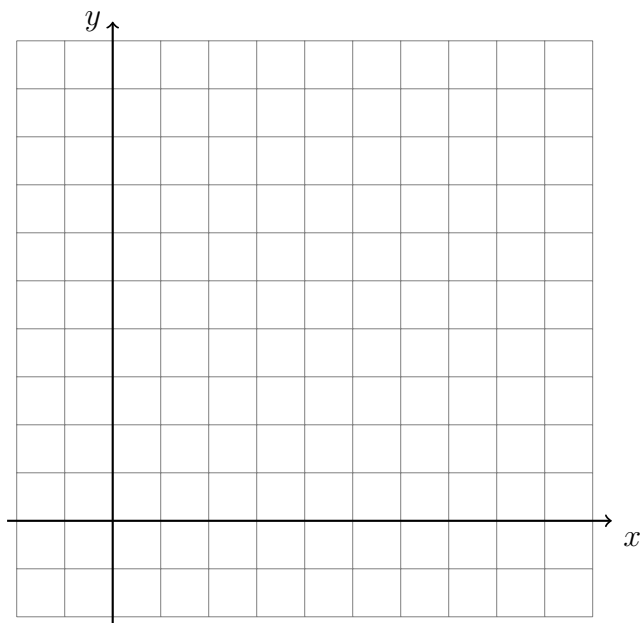
22. Given circle O with chords \overline{AD} and \overline{BE} intersecting at C , as shown in the diagram. Given $m\widehat{AB} = 45^\circ$, $m\widehat{BD} = 108^\circ$, and $m\widehat{DE} = 65^\circ$.

(a) Find the $m\angle BAD$.

(b) Find the $m\angle ACB$.



23. On the graph, draw polygon ABCDEF with vertices A(1, 1), B(1, 4), C(3, 4), D(3, 7), E(8, 7), and F(8, 1). Find the perimeter and the area of the polygon.

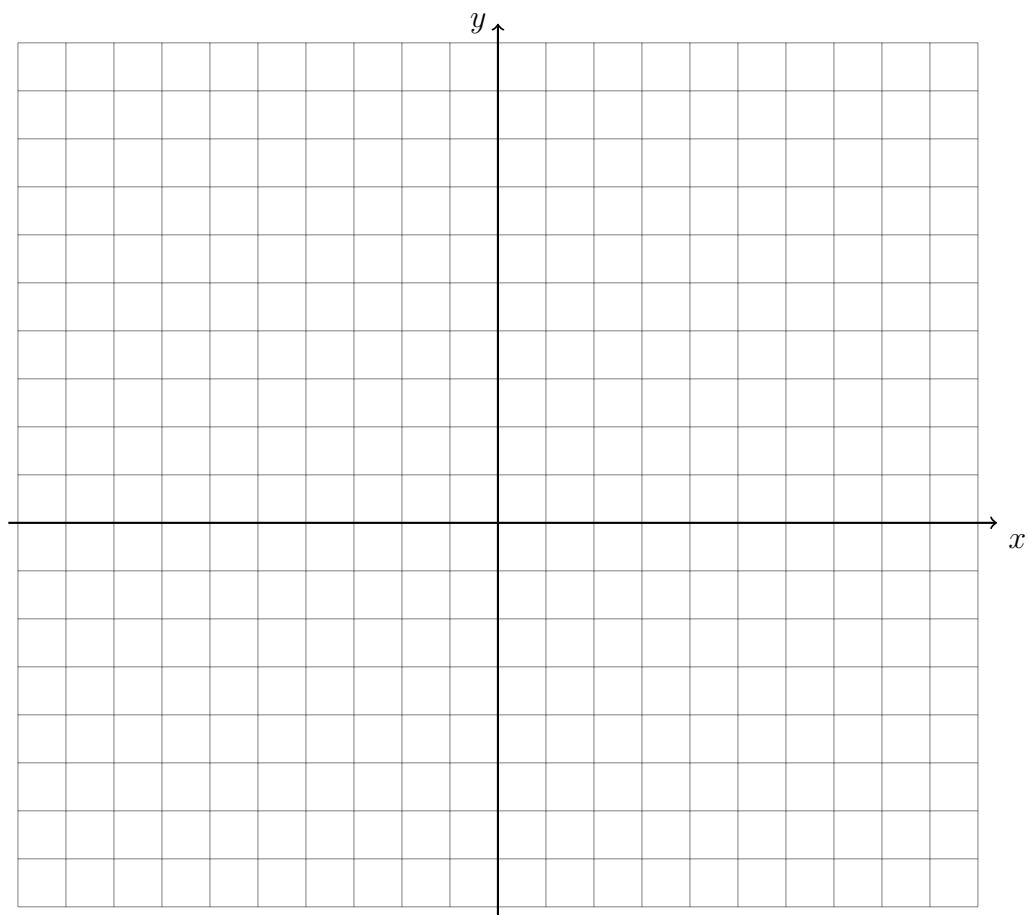


24. Graph and label the two equations. Mark their intersection as an ordered pair.

$$y = -4x - 6$$

$$x - 3y = -21$$

Are the lines parallel, perpendicular, or neither? Justify your answer.



25. The line l has the equation $y = 3x + 2$.

(a) What is the slope of the line k , given $k \parallel l$?

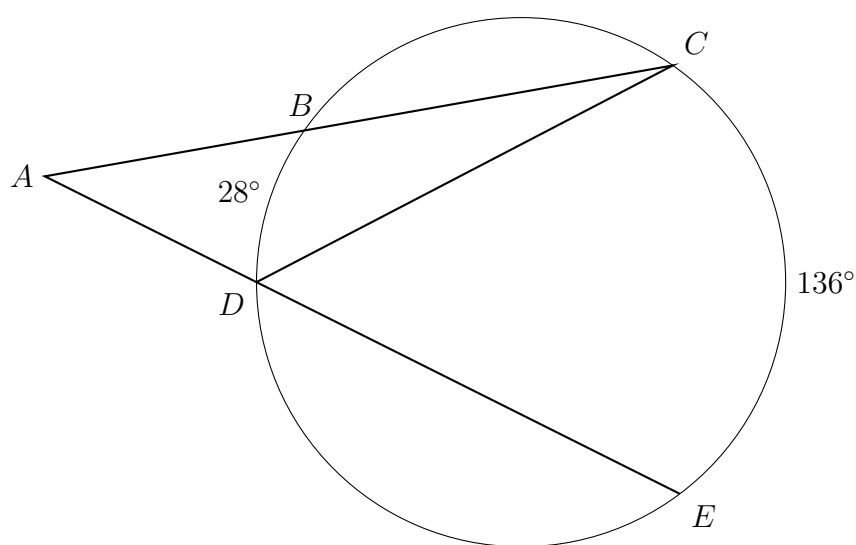
(b) What is the slope of the line m , given $m \perp l$?

26. The secants \overline{ABC} and \overline{ADE} intersect the circle O , as shown in the diagram. Given $m\widehat{BD} = 28^\circ$ and $m\widehat{CE} = 136^\circ$.

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

(b) Find the $m\angle BCD$.

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



27. Express the result to the nearest thousandth.

(a) $\sin 35^\circ =$

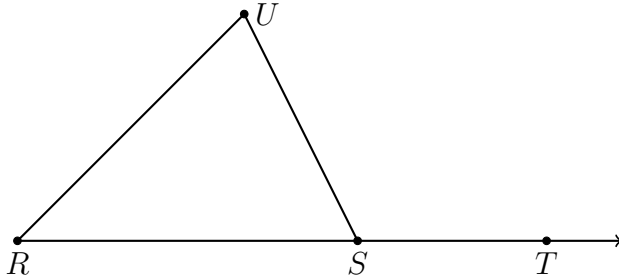
(c) $\sin 78^\circ =$

(b) $\tan 70^\circ =$

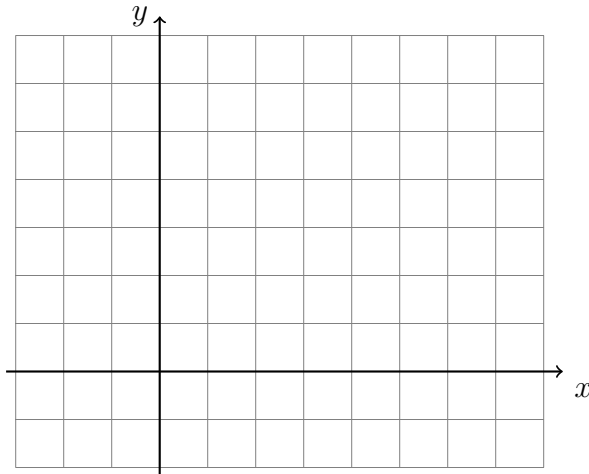
(d) $\cos 12^\circ =$

28. Given $P(7, 0)$ and $Q(3, 2)$, find the length of \overline{PQ} . Simplify the radical.

29. Given $m\angle R = 45$ and $m\angle UST = 110$. Find $m\angle U$.



30. On the graph below, draw \overline{AB} , with $A(5, 3)$ and $B(-1, -3)$, labeling the end points. Determine and state the coordinates of the midpoint M of \overline{AB} and mark and label it on the graph.



31. Given \overline{ABC} , $AC = 18$, and the point B partitions \overline{AC} in a ratio of 2:7.

Find AB .

