

MYSTERY PICTURE

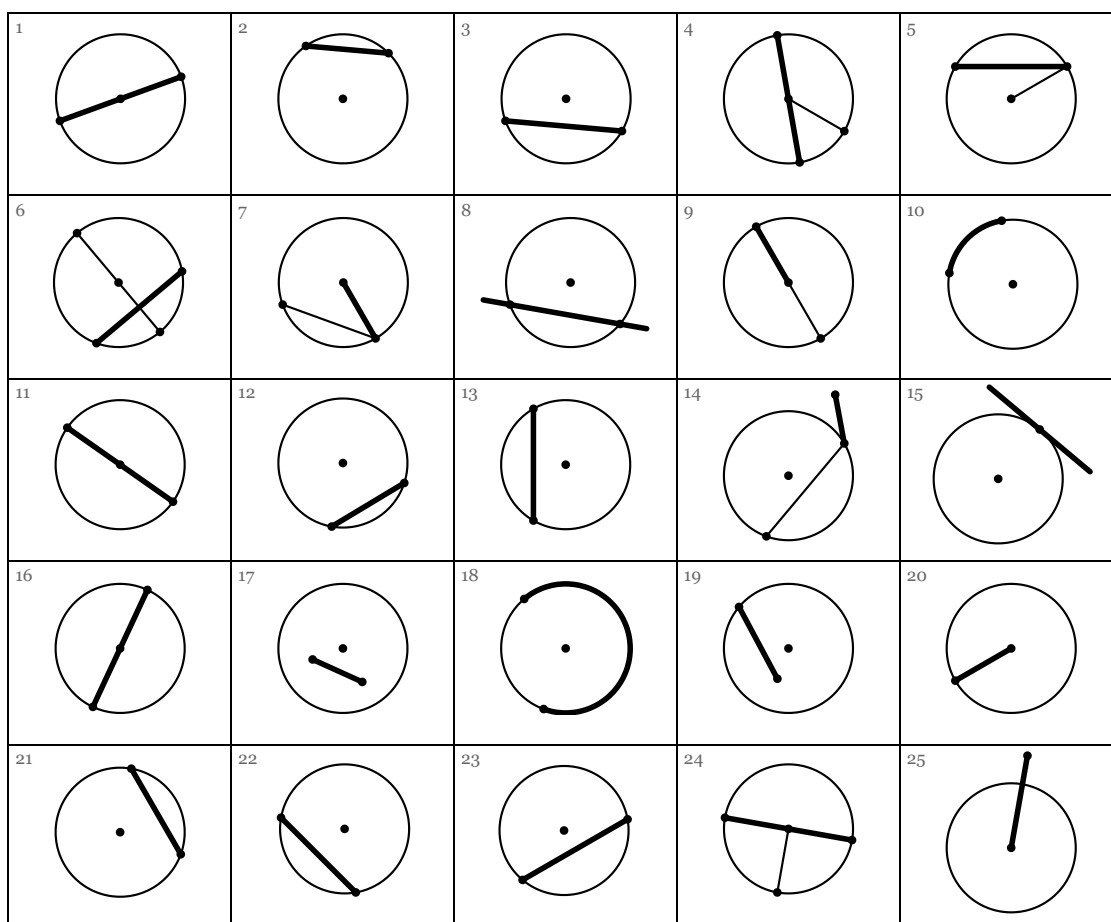


CIRCLE VOCABULARY AND SIMILAR CIRCLES

Is It a Chord?

25 circles · radius, chord, diameter, secant, tangent, arc · no numbers · a picture appears

FREE



Mystery Picture — how to run it

25–35 minutes

1. **Give each student page 3** and a pencil. Nothing else is needed.
2. **Say this once:** *“A chord is a segment with both ends on the circle. A diameter is a chord too. If the thick part is a chord, fill the square with slanted lines. If not, leave it white.”*
3. **Let them work.** The picture shows when they are right. Nothing else is needed.

Student sheet page 3, one per student. A box at the bottom shows the six names as small pictures.
Answers pages 4–5, for you.

Each square shows a circle with its center dotted and one thick part. The student decides one thing: is the thick part a chord? This sheet uses these definitions. A chord is a segment with both ends on the circle. A diameter is a chord that passes through the center. A secant is a whole line, and a tangent is a line that touches the circle once. Some textbooks use other definitions, so tell the class which ones this sheet uses. Fourteen squares are filled, and five of them are diameters.

Each white square fails in its own way. Three squares show a radius, and in one of them the radius is the thick half of a thin diameter. One shows a secant line, which runs on past the circle, and one shows a tangent line. Two show an arc, which is curved. Four show a segment with no name at all, because only one end or no end is on the circle, or because it runs past the circle.

If part of a student’s picture looks wrong, the mistake is in that square. Ask: *“Where are the two ends of the thick part? Are both of them on the circle? Is it a segment, or does it run on?”* Guessing does not work. Every simple rule that skips the definition, such as filling every square where the thick part touches the center, gets at least six squares wrong.



This is the free lesson this activity came from. The worksheet, the full answers and the lesson plan are on it, at three levels of difficulty.
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Mystery Picture — is it a chord?

Circle vocabulary

Name _____

Period _____

Date _____

Each square shows a circle with its center dotted and one thick part. **Is the thick part a chord? If yes, fill the square with slanted lines. If no, leave it white.** A chord is a segment with both ends on the circle. A diameter is a chord too. A picture appears. If part of it is missing, check that square again.

1 	2 	3 	4 	5
6 	7 	8 	9 	10
11 	12 	13 	14 	15
16 	17 	18 	19 	20
21 	22 	23 	24 	25

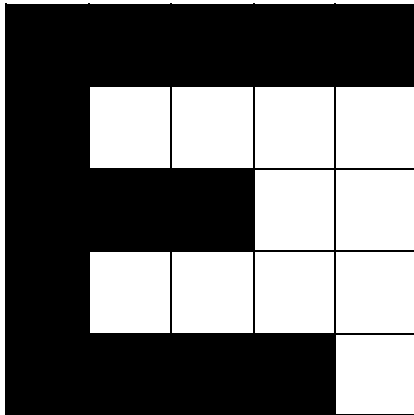
radius	chord	diameter (a chord)	secant line	tangent line	arc



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Mystery Picture — answers

For the teacher



The finished picture is **the letter E**. Fourteen squares are filled.

To check a square, find the two ends of the thick part. It is a chord only when it is a segment and both ends are on the circle. The table gives the reason for every square. It goes on over the page.

	The square	Answer	Why
1	A thick segment across the circle through the center.	fill a diameter, so a chord	Both ends are on the circle and it passes through the center, so it is a diameter, and a diameter is a chord.
2	A short thick segment near the top, closer to the circle than to the center, both ends on the circle.	fill a chord	Both ends are on the circle, so it is a chord. It does not pass through the center, so it is not a diameter.
3	A long thick segment below the center, both ends on the circle.	fill a chord	Both ends are on the circle, so it is a chord. It does not pass through the center, so it is not a diameter.
4	A thick segment through the center, with a thin radius beside it.	fill a diameter, so a chord	Both ends are on the circle and it passes through the center, so it is a diameter, and a diameter is a chord.
5	A thick segment across the top, both ends on the circle; a thin radius meets one end.	fill a chord	Both ends are on the circle, so it is a chord. It does not pass through the center, so it is not a diameter.
6	A thick segment on the lower right, both ends on the circle; a thin diameter crosses it.	fill a chord	Both ends are on the circle, so it is a chord. It does not pass through the center, so it is not a diameter.
7	A thick segment from the center to the circle; a thin segment joins its end to another point of the circle.	white a radius	It runs from the center to a point on the circle, so it is a radius. Only one end is on the circle, so it is not a chord.
8	A thick line that crosses the circle twice and runs on past it on both sides.	white a secant line	It is a line: it runs on past the circle on both sides. It meets the circle twice, so it is a secant line, not a chord.
9	A thin segment across the circle through the center; only its upper half, from the center to the circle, is thick.	white a radius	It runs from the center to a point on the circle, so it is a radius. Only one end is on the circle, so it is not a chord.
10	A thick curved piece of the circle on the upper left.	white an arc	It is a curved piece of the circle itself, so it is an arc, not a segment.
11	A thick segment through the center, slanting down to the right.	fill a diameter, so a chord	Both ends are on the circle and it passes through the center, so it is a diameter, and a diameter is a chord.
12	A short thick segment near the bottom right, closer to the circle than to the center, both ends on the circle.	fill a chord	Both ends are on the circle, so it is a chord. It does not pass through the center, so it is not a diameter.

Mystery Picture — answers, squares 13 to 25

For the teacher

	The square	Answer	Why
13	A thick upright segment on the left, both ends on the circle.	fill a chord	Both ends are on the circle, so it is a chord. It does not pass through the center, so it is not a diameter.
14	A thick segment from a point of the circle to a point outside it; a thin segment joins its first end to another point of the circle.	white no name	One end is on the circle and the other is outside it, so it is not a radius and not a chord. It has no name on this sheet.
15	A thick line that touches the circle at one point on the upper right.	white a tangent line	It is a line that meets the circle at one point, so it is a tangent line, not a segment.
16	A thick segment through the center, slanting up to the right.	fill a diameter, so a chord	Both ends are on the circle and it passes through the center, so it is a diameter, and a diameter is a chord.
17	A thick segment with both ends inside the circle.	white no name	Both ends are inside the circle, so it is not a radius and not a chord. It has no name on this sheet.
18	A thick curved piece of the circle, more than half of it, running over the top.	white an arc	It is a curved piece of the circle itself, so it is an arc, not a segment.
19	A thick segment from a point of the circle to a point inside it.	white no name	One end is on the circle and the other is inside it, so it is not a radius and not a chord. It has no name on this sheet.
20	A thick segment from the center down to the left, to a point of the circle.	white a radius	It runs from the center to a point on the circle, so it is a radius. Only one end is on the circle, so it is not a chord.
21	A thick segment on the upper right, both ends on the circle.	fill a chord	Both ends are on the circle, so it is a chord. It does not pass through the center, so it is not a diameter.
22	A thick segment on the lower left, both ends on the circle.	fill a chord	Both ends are on the circle, so it is a chord. It does not pass through the center, so it is not a diameter.
23	A long thick segment that passes just below the center, both ends on the circle.	fill a chord	Both ends are on the circle, so it is a chord. It does not pass through the center, so it is not a diameter.
24	A thick segment through the center, nearly level, with a thin radius below it.	fill a diameter, so a chord	Both ends are on the circle and it passes through the center, so it is a diameter, and a diameter is a chord.
25	A thick segment from the center that runs out past the circle.	white no name	It starts at the center but runs past the circle, so it is not a radius and not a chord. It has no name on this sheet.