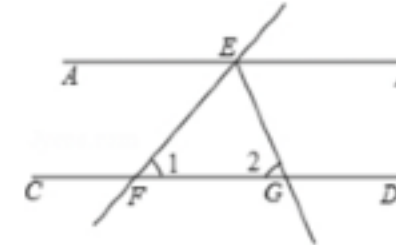


MATHVERSE

Background, Motivation

- Do MLLMs truly see the math diagrams in evaluation?
- Existing math benchmarks include text redundancy.
- In our ablation study, we find MLLMs' performance without text redundancy is worse than its performance without diagram.

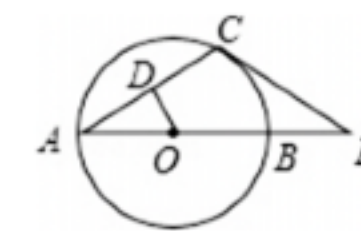
GeoQA



Question:

As shown in the figure, AB is parallel to CD, and a straight line EF intersects AB at point E, intersects CD at point F, EG bisects angle BEF, and it intersects CD at point G, angle 1 = 50° , angle 2 is equal to ()

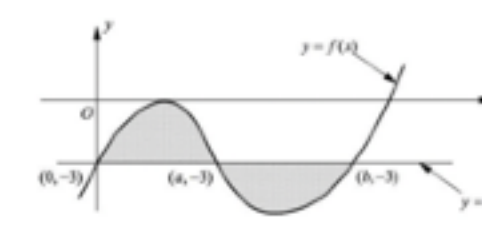
MathVista



Question:

AB is the diameter of $\odot O$, C is the point on $\odot O$, passing point C is the tangent of $\odot O$ and intersects the extended line of AB at point E, $OD \perp AC$ at point D, if $\angle E = 30^\circ$, $CE = 6.0$, the value of OD is ()

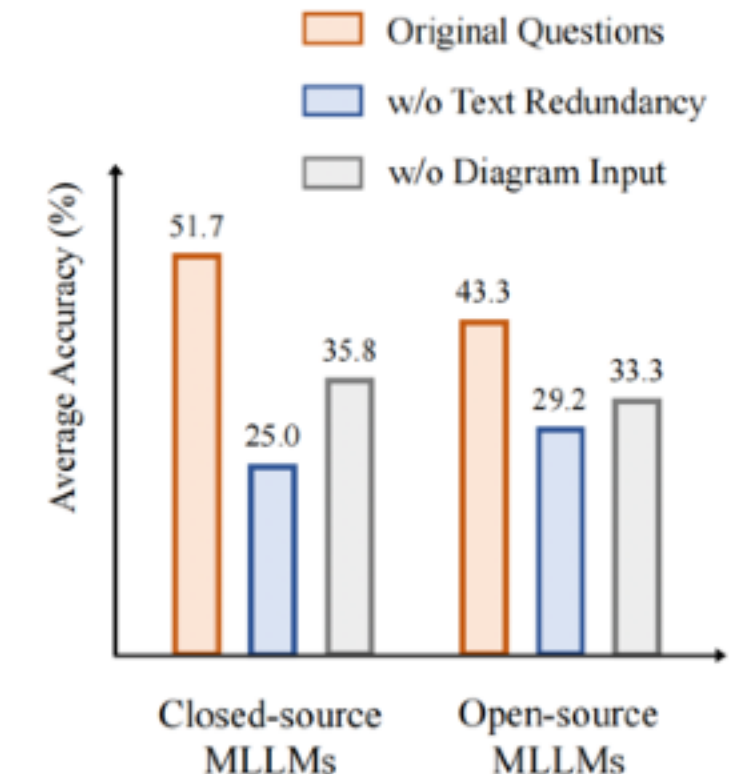
MMMU



Question:

The curve $y = f(x)$ and the line $y = -3$, as shown in the figure, intersect at the points $(0, -3)$, $(a, -3)$, and $(b, -3)$. The sum of the area of the shaded region enclosed by the curve and the line is given by ()





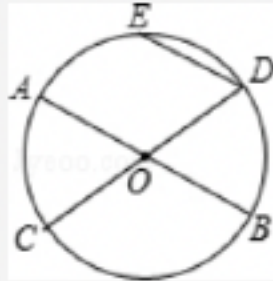

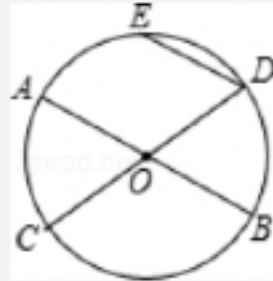
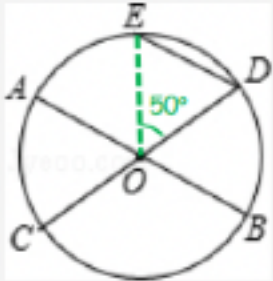
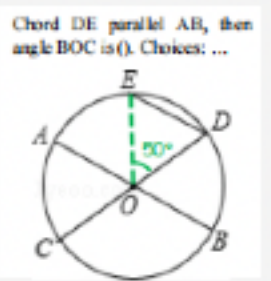


(a) **Text Redundancy** within Existing Benchmarks



(b) Ablation Study

Mathverse

Contribution 1 — The Benchmark

	Descriptive Information	Implicit Property	Essential Condition			
	Text Dominant	Text Lite	Text Only	Vision Intensive	Vision Dominant	Vision Only
 Text Input	AB and CD are two diameters of circle O, chord DE parallel AB, arc DE is the arc of 50°, then angle BOC is (). Choices: ...	Chord DE parallel AB, arc DE is the arc of 50°, then angle BOC is (). Choices: ...	AB and CD are two diameters of circle O, chord DE parallel AB, arc DE is the arc of 50°, then angle BOC is (). Choices: ...	Arc DE is the arc of 50°, then angle BOC is (). Choices: ...	Chord DE parallel AB, then angle BOC is (). Choices: ...	
 Vision Input						
 Text Dominant	Text Lite	Vision Dominant	 Text Dominant	Text Lite	Vision Dominant	
Find the surface area of the cylinder shown. The height is 10 cm and the radius is 6 cm. Give your answer to two decimal places.	Find the surface area of the cylinder shown. and the radius is 6 cm. Give your answer to two decimal places.	Find the surface area of the cylinder shown. Give your answer to two decimal places.	The graph shows $y_1 = x^3$ passing (0,0) and a vertical or horizontal translation y_2 passing (-2,0). Write an equation for y_2 as shown.	The graph shows $y_1 = x^3$ and a vertical or horizontal translation y_2 . Write an equation for y_2 as shown.	The graph shows y_1 and a vertical or horizontal translation y_2 . Write an equation for y_2 as shown.	
