



Measuring Angles

Mana Maths

Measuring Angles - Notes and Steps



Key idea



An **angle** is the turn between two rays from a common **vertex**. We measure it in **degrees** ($^{\circ}$) with a **protractor**.

Using a protractor



1. Centre cross on the **vertex**.
2. Line up 0° with one arm.
3. Read where the other arm crosses.

Common mistake

Reading the wrong scale. **Estimate first:** if an angle looks acute but you read 120° , swap to the other scale.

Types of Angle



Key idea



We name an angle by its **size**.
Estimate the type before you measure.

The five types



Acute: less than 90°

Right: exactly 90°

Obtuse: between 90° and 180°

Straight: exactly 180°

Reflex: more than 180°

Example



85° is **acute** (just under a right angle).

195° is **reflex** (more than a straight line).

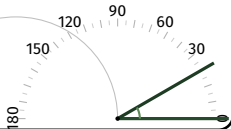
Common mistake

Naming by size, not by looks.
An angle that opens wide past a straight line is **reflex**, not obtuse.

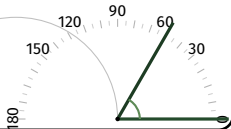
Start Tasks



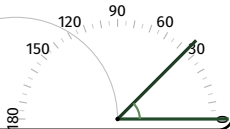
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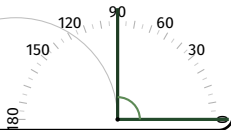
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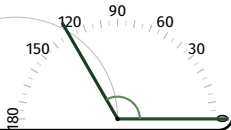
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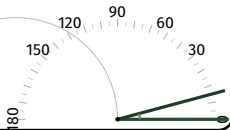
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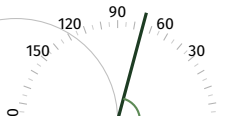
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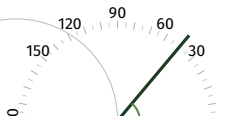
6.



7.



8.



9. A protractor measures angles in: A.
centimetres B.
degrees C. metres

Start Tasks - Answers



1. B (30°)

2. B (60°)

3. B (45°)

4. B (90°)

5. B (120°)

6. A (15°)

7. C (75°)

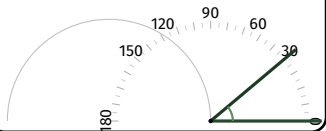
8. B (50°)

9. B (degrees)

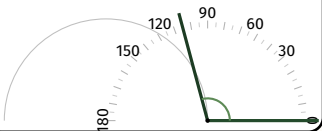
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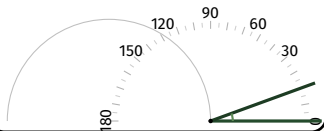
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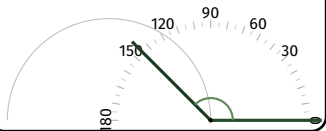
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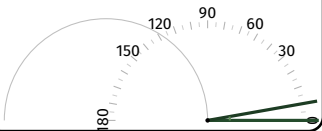
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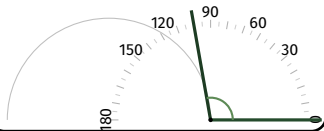
13.



14.



15.



16. An angle of 90° is called: A. acute B. right C. obtuse D. reflex

17. An angle less than 90° is: A. right B. obtuse C. acute D. reflex

18. An angle between 90° and 180° is: A. acute B. right C. obtuse D. reflex

Start Tasks - Answers



10. 40°

11. 105°

12. 20°

13. 135°

14. 10°

15. 100°

16. B (right)

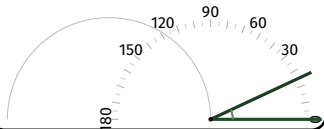
17. C (acute)

18. C (obtuse)

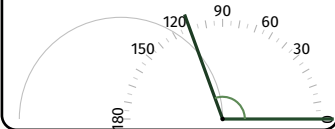
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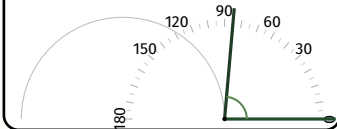
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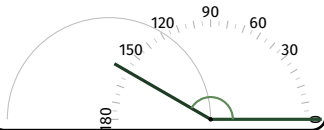
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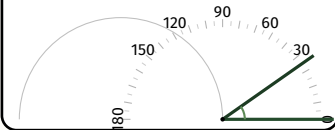
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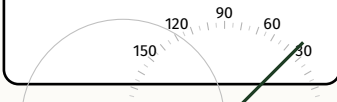
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23.



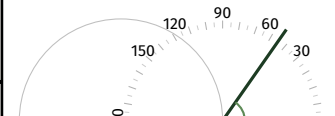
24. Which of these is 90°? A.



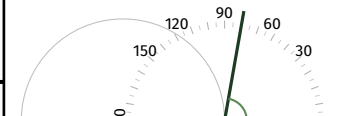
25.



26.



27.



Start Tasks - Answers



19. 25° , acute

20. 110° , obtuse

21. 85° , acute

22. 150° , obtuse

23. 35° , acute

24. B (90°)

25. 165° , obtuse

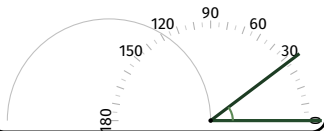
26. 55° , acute

27. 80° , acute

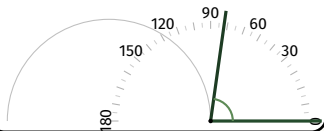
Build Tasks



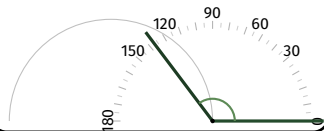
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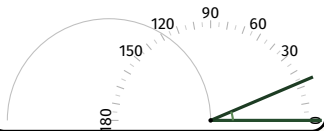
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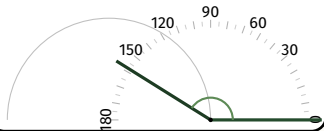
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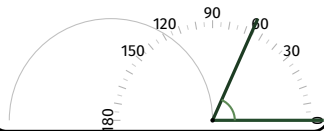
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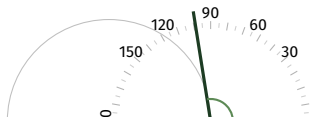
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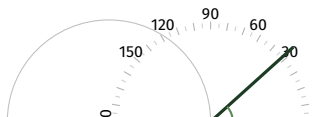
6.



7.



8.



9.



Build Tasks - Answers



1. 37°

2. 82°

3. 127°

4. 23°

5. 148°

6. 66°

7. 99°

8. 42°

9. 155°

Build Tasks

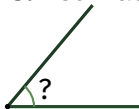


10. Estimate each angle, then check with the given measure.



Estimate:

13. Estimate:



Estimate:

° Actual: 50°

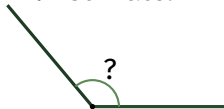
16. A reflex angle is:
A. less than 90° B.
between 90° and 180°
C. more than 180° D.

11. Estimate each angle, then check with the given measure.



Estimate:

14. Estimate:



Estimate: °

17. Classify 178° :
A. acute B. right C.
obtuse D. reflex

12. Estimate each angle, then check with the given measure.



15. Estimate:



Estimate:

18. Classify 200° :
A. acute B. right C.
obtuse D. reflex

Build Tasks - Answers



**10. Estimate varies;
actual 35° . Error =
 $|\text{estimate} - 35|$**

**11. Estimate varies;
actual 70° . Error =
 $|\text{estimate} - 70|$**

**12. Estimate varies;
actual 115° . Error =
 $|\text{estimate} - 115|$**

**13. Estimate varies;
actual 50° .**

**14. Estimate varies;
actual 130° .**

**15. Estimate varies;
actual 85° .**

16. C (more than 180°)

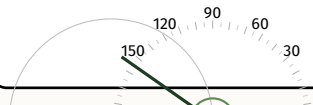
17. C (obtuse)

18. D (reflex)

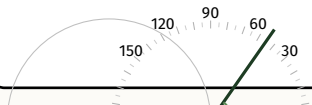
Build Tasks



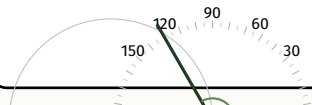
19. Read the reflex angle.



20. Read the reflex angle.



21. Read the reflex angle.



22. Classify each angle:

- a) 47° _____ b) 91° _____
c) 180° _____ d) 270° _____

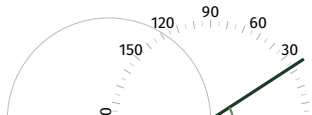
23. A protractor has two scales (inner and outer). When measuring, you should:

24. If the inner scale reads 40° , the outer scale reads:
A. 40° B. 140° C. 220° D. 320°

25.



26.



27.



Build Tasks - Answers



19. Reflex = $360^\circ - 145^\circ = 215^\circ$

20. Reflex = $360^\circ - 55^\circ = 305^\circ$

21. Reflex = $360^\circ - 120^\circ = 240^\circ$

22. a) acute, b) obtuse, c) straight, d) reflex

23. C (Start from 0° on whichever scale lines up)

24. B (140°)

25. 78° , acute

26. 33° , acute

27. 163° , obtuse

Push Tasks



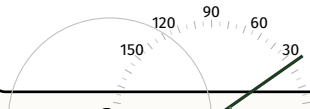
1. Sarah measured this angle and said it is 60° .



2. Tom measured an angle and got 130° but the correct answer was 50° .



3. Mia says this angle is 35° .



4. Describe the steps to use a protractor to measure $\angle ABC$. Step 1:

_____ Step 2:

_____ Step 3:

5. Describe how to construct an angle of 75° using a protractor.

6. A student says "I measured and got 142° , so the angle is acute." Is this correct? Explain.

7. In this diagram, $\angle AOB = 30^\circ$ and $\angle BOC = 50^\circ$.

B

8. The reflex angle around point O from OA to OC is 250° .

C B

9. Three rays divide a full turn (360°). $\angle AOB = 85^\circ$, $\angle BOC = 95^\circ$. Find

Push Tasks - Answers



1. No — Sarah read the outer scale. 120° is correct; it is obtuse, not acute like a 60°

2. Tom read the outer scale instead of inner (130° on outer = 50° on inner), or

3. 35° is acute (less than 90°). Correct measurement.

4. 1. Place centre on vertex B. 2. Align 0° with ray BA. 3. Read where ray BC crosses

5. 1. Draw a baseline ray. 2. Place protractor centre at endpoint, 0° on ray. 3. Mark at 75° ,

6. No — 142° is obtuse (between 90° and 180°), not acute. The student confused the

7.
 $\angle AOC = 30^\circ + 50^\circ = 80^\circ$

8. Reflex = 250° , so acute/obtuse = $360^\circ - 250^\circ = 110^\circ$ (obtuse)

9. $\angle COA = 360^\circ - 85^\circ - 95^\circ = 180^\circ$ (straight angle)

Push Tasks



10. Estimate $\angle AOB$ in this diagram, then explain how you would measure it.

13. A student placed the protractor centre at the wrong point. They measured:

120, 90, 60

16. A clock shows 2:00. The hour hand points at 2, the minute hand at 12. Without

11. A builder needs to measure the angle of a roof slope. The bubble level shows horizontal. The protractor reads

14. You measure an angle as 47° . Your friend also measures it and gets 43° . Give two possible reasons for

17. A pizza is cut into 8 equal slices. What is the angle at the tip of each slice? Describe

12. Two walls meet. You place a protractor and measure 87° . The plans show the room should have 90°

15. Prove: If $\angle AOB$ is acute and $\angle BOC$ is acute, then $\angle AOC$ must be either acute or obtuse (not reflex).

18. The hour hand moves from 2 to 5. What angle does it sweep through?

Push Tasks - Answers



10. Estimate: approx 70–75°. To measure: place protractor centre at vertex, align

11. Roof angle = 22° from horizontal

12. Off by 3°. Not within 1° tolerance — walls are out of square.

13. The centre was not on the vertex. Fix: ensure the protractor hole is exactly on the

14. 1. Different scale reading (inner vs outer). 2. Different alignment of

15. Acute = less than 90°. Sum of two acute angles < 180°, so $\angle AOC < 180^\circ$ — not reflex.

16. $360^\circ \div 12 \times 2 = 60^\circ$. Place protractor on the clock face centre, align 0° on 12, read at 2.

17. $360^\circ \div 8 = 45^\circ$. Place protractor centre at pizza centre, align one cut line, read 45° to the next.

18. 3 hours $\times$ 30°/hour = 90°. A protractor can measure the angle directly from centre of clock if drawn.

Push Tasks



19. You measure $\angle A$ as 67° on the inner scale. What would the outer scale read at the same position? Explain.

22. $\angle AOB$ is marked as 36° . $\angle BOC$ as 72° .
 $\angle COD$ as 54° .

C

25. Explain why measuring an angle from a printed worksheet with a

20. You need to draw a 215° angle. Describe how you would do this with a protractor (only $0-180^\circ$ scale).

23. In the diagram, $\angle AOC = 155^\circ$ and $\angle AOB = 60^\circ$. Find $\angle BOC$.

120 90 60

26. A clock shows 3:40. Calculate the angle between the hour and minute hands (smaller

21. A triangle has angles that measure 47° , 62° , and the third is unknown. The student measures the third

24. Design a 3-step checklist for using a protractor correctly. 1.
_____ 2.

3

27. Create an angle problem: Draw two rays from a point with a third ray between

Push Tasks - Answers



19. $180^\circ - 67^\circ = 113^\circ$.
Inner and outer scales
sum to 180° .

22. $36^\circ + 72^\circ + 54^\circ = 162^\circ$

25. Print scaling
changes the actual
size. Instead, read the
measure given or use
angle facts to
calculate

20. Draw a 180°
straight line, then
measure 35° on the
other side ($180^\circ + 35^\circ$

23. $\angle BOC =$
 $155^\circ - 60^\circ = 95^\circ$

26. Hour hand: at 3 =
 90° , at 3:40 = $90^\circ +$
 $(40/60 \times 30^\circ) = 110^\circ$.
Minute hand: at 40 =
 240° . Difference =
 $|240^\circ - 110^\circ| = 130^\circ$ (or

21. $47^\circ + 62^\circ + \text{third} = 180^\circ$, so third = 71° . The student was correct.

24. 1. Centre on vertex.
2. Align baseline with
 0° . 3. Read correct
scale at the other ray.

27. Answers will vary.
Example: $\angle AOB = 30^\circ$,
 $\angle BOC = 50^\circ$. Find
 $\angle AOC$. Answer: 80° .