Circle Graphs

Apply the skill to decisions and designs

Name _____ **Date** _____ **Score** _____ / 6

QUICK REVIEW

A circle graph shows parts of a whole. Multiply a share written as a fraction by the total to find a count, or by 360° to find an angle. Check that shares sum to 100% and sector angles sum to 360°.

Worked example

A category contains 14 of 70 items. Find its percent and angle.

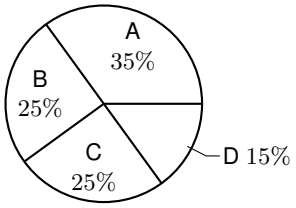
1. Divide the part by the whole: $14/70 = 1/5$.
2. Write that fraction as a percent: $1/5 = 20\%$.
3. Multiply by one full turn: $(1/5)(360) = 72^\circ$.

Answer: 20%; 72°.

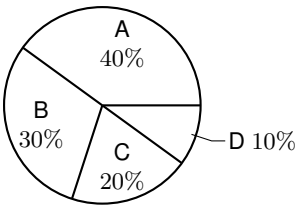
Practice Problems

Show your thinking.

1. This graph represents 120 entries. Six entries move from A to D without changing the total. Give the new percentages and central angles for A and D.

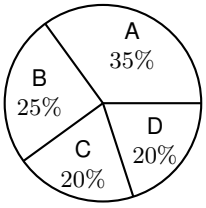


2. A designer must merge exactly two categories into a 144° sector. Which pair in the graph works? Explain why no other pair works.

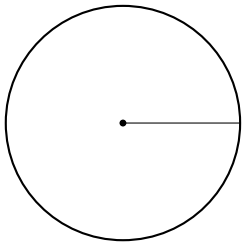


3. Two surveys will share one circle graph. At site 1, A is 25% of 80 responses; at site 2, A is 50% of 40. Find A as a fraction of the pooled responses and its angle. Does simply averaging the two percentages work?

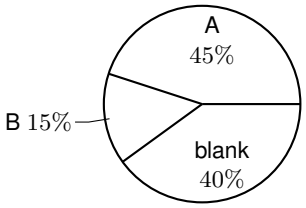
4. A display uses the graph proportions and must show whole people in every category. Which total, 30, 40, or 50, works? Give all four counts for the working total.



5. A library poll has 36 art, 12 music, 8 drama, and 4 dance votes. Merge drama and dance into Stage. Draw a labeled circle graph for Art, Music, and Stage. Give the percentages and all three angles.



6. A poll has 45 votes for A, 15 for B, and 40 blank ballots. A revised graph excludes the blanks. Find the new A percent and angle. By how many percentage points did the A share rise?



Answer Key

1. A: 30%, 108°. D: 20%, 72°.

2. Merge B and D; together they have 40%, or 144°.

3. A is $1/3$ of the pool; angle 120°. A simple average does not work.

4. Total 40: A 14, B 10, C 8, D 8.

5. Art 60%, 216°; Music 20%, 72°; Stage 20%, 72°. See the completed graph below.

6. A is now 75%, angle 270°, up 30 percentage points.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. Moving 6 out of 120 shifts $6/120 = 5\%$ of the whole from A to D.

2. A changes to $35\% - 5\% = 30\%$; D changes to $15\% + 5\% = 20\%$.

3. With the same whole, the new angles are $(30/100)(360) = 108^\circ$ and $(20/100)(360) = 72^\circ$.

Problem 2

1. The target share is $144/360 = 40\%$. A already has 40%, so adding any category to A exceeds the target.

2. Of the others, B and C total $30\% + 20\% = 50\%$, while C and D total $20\% + 10\% = 30\%$.

3. Only B and D total $30\% + 10\% = 40\%$, giving $(40/100)(360) = 144^\circ$.

Problem 3

1. A has $(25/100)(80) = 20$ responses at site 1 and $(50/100)(40) = 20$ at site 2.

2. Pool the counts before dividing: $(20 + 20)/(80 + 40) = 40/120 = 1/3$. Its angle is $(1/3)(360) = 120^\circ$.

3. Averaging gives $(25\% + 50\%)/2 = 37.5\%$, or $3/8$, not $1/3$. The site totals are different.

Problem 4

1. A uses $35\% = 7/20$. Totals 30 and 50 give A counts 10.5 and 17.5, not whole people.

2. With 40 people, A is $(35/100)(40) = 14$ and B is $(25/100)(40) = 10$.

3. C and D are each $(20/100)(40) = 8$. All are whole and $14 + 10 + 8 + 8 = 40$.

Problem 5

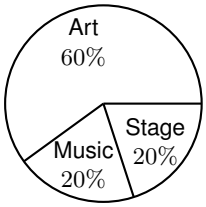
1. Stage gets $8 + 4 = 12$ votes, and there are $36 + 12 + 12 = 60$ votes in all.

2. Art is $36/60 = 60\%$; Music and Stage are each $12/60 = 20\%$.

3. Multiply each share of the whole by 360°: Art 216°, Music 72°, Stage 72°.

4. Check the full circle: $216 + 72 + 72 = 360^\circ$.

5. Start at the printed ray and measure counterclockwise. Draw radii at $216, 288$ degrees from the start. Label each sector with its category and percent.



Problem 6

1. Excluding the blank ballots leaves $45 + 15 = 60$ votes. A keeps all 45 of its votes.

2. The new share is $45/60 = 75\%$ and its angle is $(75/100)(360) = 270^\circ$.

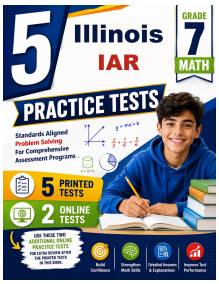
3. With the blanks included, A was $45/100 = 45\%$. The change is $75 - 45 = 30$ percentage points.

TESTINAR

Keep Building Grade 7 Math Skills

Choose the practice book matched to your state assessment and turn worksheet practice into a complete test-prep plan.

All Grade 7 books



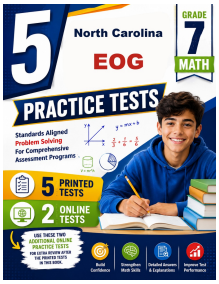
ILLINOIS IAR

5 Full-Length Math Practice Tests

Build Grade 7 accuracy, confidence, and test stamina with 5 printable practice tests.

Printable eBook • Instant PDF access

View eBook



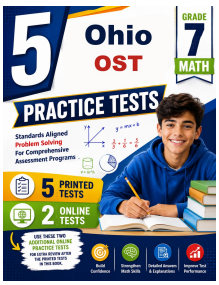
NORTH CAROLINA EOG

5 Full-Length Math Practice Tests

Build Grade 7 accuracy, confidence, and test stamina with 5 printable practice tests.

Printable eBook • Instant PDF access

View eBook



OHIO OST

5 Full-Length Math Practice Tests

Build Grade 7 accuracy, confidence, and test stamina with 5 printable practice tests.

Printable eBook • Instant PDF access

View eBook

Need a different state?
Testinar has Grade 7 math practice books for state assessments across the country.

TESTINAR.COM/GRADES/7