Circle Graphs

Circle graphs: Mistakes and missing information

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

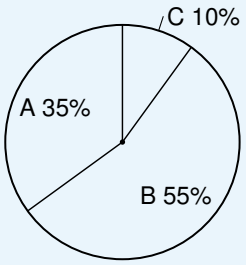
QUICK REVIEW

A circle graph shows parts of one whole, totaling 100% and $360°$. A 25% sector has angle $0.25 \times 360 = 90°$; among 40 people it represents $0.25 \times 40 = 10$ people. Category count = percent $\times$ total, and sector angle = percent $\times 360°$. Use a protractor when drawing.

Worked example

Read a three-category survey. There are 20 observations. Use the labeled graph to find each category count and sector angle.

1. The percentages total $35\% + 55\% + 10\% = 100\%$.
2. Counts: $20 \times 35/100 = 7$; $20 \times 55/100 = 11$; $20 \times 10/100 = 2$.
3. Sector angles: $360 \times 35/100 = 126°$; $360 \times 55/100 = 198°$; $360 \times 10/100 = 36°$. Counts total 20; angles total $360°$.
Answer: Counts A: 7, B: 11, C: 2. Angles A: $126°$, B: $198°$, C: $36°$.

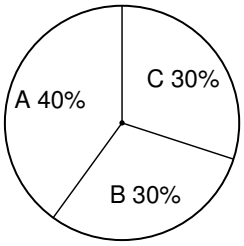


Practice Problems

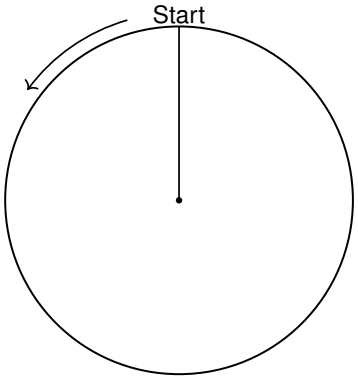
Show your thinking.

1. A student uses $25°$ for a 25% sector. Correct all counts and angles. There are 80 observations. Use A: 50%, B: 25%, C: 25%. Find each category count and sector angle.

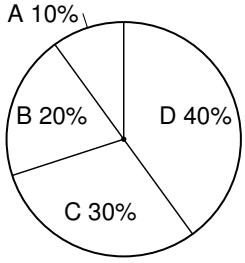
2. Recover counts from the sector percentages. There are 20 observations. Use the labeled graph to find each category count and sector angle.



3. A student divides total by each percent number. Repair the graph construction. There are 50 observations. Use A: 20%, B: 30%, C: 50%. Draw and label the circle graph from the top ray, counterclockwise. Find counts and angles.

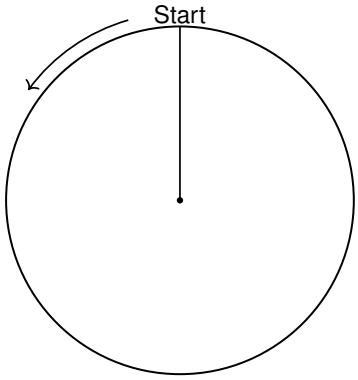


4. Recover category frequencies and sector sizes from the display. There are 40 observations. Use the labeled graph to find each category count and sector angle.



5. Explain how a half-circle differs from a quarter-circle. There are 60 observations. Use A: 25%, B: 25%, C: 50%. Find each category count and sector angle.

6. Design sectors whose angles sum to one full turn. There are 100 observations. Use A: 40%, B: 20%, C: 20%, D: 20%. Draw and label the circle graph from the top ray, counterclockwise. Find counts and angles.



Answer Key

1. Counts A: 40, B: 20, C: 20. Angles A: $180°$, B: $90°$, C: $90°$.
2. Counts A: 8, B: 6, C: 6. Angles A: $144°$, B: $108°$, C: $108°$.
3. Counts A: 10, B: 15, C: 25. Angles A: $72°$, B: $108°$, C: $180°$.
4. Counts A: 4, B: 8, C: 12, D: 16. Angles A: $36°$, B: $72°$, C: $108°$, D: $144°$.
5. Counts A: 15, B: 15, C: 30. Angles A: $90°$, B: $90°$, C: $180°$.
6. Counts A: 40, B: 20, C: 20, D: 20. Angles A: $144°$, B: $72°$, C: $72°$, D: $72°$.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. The percentages total $50\% + 25\% + 25\% = 100\%$.

2. Counts: $80 \times 50/100 = 40$; $80 \times 25/100 = 20$; $80 \times 25/100 = 20$.

3. Sector angles: $360 \times 50/100 = 180°$; $360 \times 25/100 = 90°$; $360 \times 25/100 = 90°$. Counts total 80; angles total $360°$.

4. A quarter of the whole circle is $360/4 = 90°$, not $25°$; percent and angle use different units.

Problem 2

1. The percentages total $40\% + 30\% + 30\% = 100\%$.

2. Counts: $20 \times 40/100 = 8$; $20 \times 30/100 = 6$; $20 \times 30/100 = 6$.

3. Sector angles: $360 \times 40/100 = 144°$; $360 \times 30/100 = 108°$; $360 \times 30/100 = 108°$. Counts total 20; angles total $360°$.

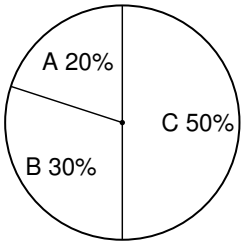
Problem 3

1. The percentages total $20\% + 30\% + 50\% = 100\%$.

2. Counts: $50 \times 20/100 = 10$; $50 \times 30/100 = 15$; $50 \times 50/100 = 25$.

3. Sector angles: $360 \times 20/100 = 72°$; $360 \times 30/100 = 108°$; $360 \times 50/100 = 180°$. Counts total 50; angles total $360°$.

4. Start at the top radius. From the center, measure each next angle counterclockwise from the last boundary. Label each wedge; the last one returns to the top.



Problem 4

1. The percentages total $10\% + 20\% + 30\% + 40\% = 100\%$.

2. Counts: $40 \times 10/100 = 4$; $40 \times 20/100 = 8$; $40 \times 30/100 = 12$; $40 \times 40/100 = 16$.

3. Sector angles: $360 \times 10/100 = 36°$; $360 \times 20/100 = 72°$; $360 \times 30/100 = 108°$; $360 \times 40/100 = 144°$. Counts total 40; angles total $360°$.

Problem 5

1. The percentages total $25\% + 25\% + 50\% = 100\%$.

2. Counts: $60 \times 25/100 = 15$; $60 \times 25/100 = 15$; $60 \times 50/100 = 30$.

3. Sector angles: $360 \times 25/100 = 90°$; $360 \times 25/100 = 90°$; $360 \times 50/100 = 180°$. Counts total 60; angles total $360°$.

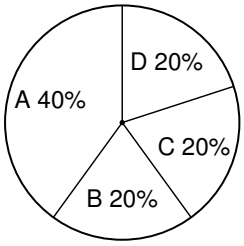
Problem 6

1. The percentages total $40\% + 20\% + 20\% + 20\% = 100\%$.

2. Counts: $100 \times 40/100 = 40$; $100 \times 20/100 = 20$; $100 \times 20/100 = 20$; $100 \times 20/100 = 20$.

3. Sector angles: $360 \times 40/100 = 144°$; $360 \times 20/100 = 72°$; $360 \times 20/100 = 72°$; $360 \times 20/100 = 72°$. Counts total 100; angles total $360°$.

4. Start at the top radius. From the center, measure each next angle counterclockwise from the last boundary. Label each wedge; the last one returns to the top.



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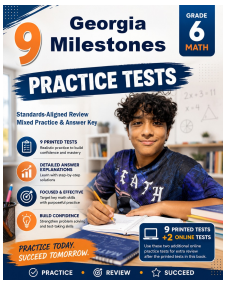

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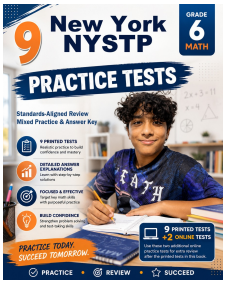

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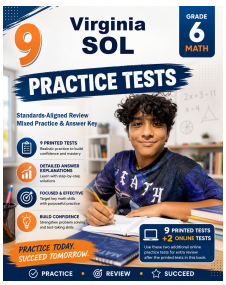

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