GRADE 7 · UNIT 7 · UNIT REVIEW

Unit 7 Review

MA.7.AR.3.1, MA.7.DP.1.4

I can draw a circle graph from a table and answer every circle-graph and percent question the test will ask.

Warm-Up

1. Of 380 students, 35% walk, 20% bike. How many more walk?
2. A $6.45 tip on a $43 meal: what percent of the meal is the tip?
3. A drawing uses 1 cm : 3 m. A wall is 8.5 cm on it. Real length?
4. Write 7.5% as a decimal.

Warm-Up

1. Of 380 students, 35% walk, 20% bike. How many more walk?

   57 students

2. A $6.45 tip on a $43 meal: what percent of the meal is the tip?

   15%

3. A drawing uses 1 cm : 3 m. A wall is 8.5 cm on it. Real length?

   25.5 m

4. Write 7.5% as a decimal. **0.075**

Vocabulary

central angle

the angle of a sector at the center of the circle: the sector's fraction of 360°

sale price

the price after a discount — a tax charged at the register is a percent of it

initial value

the amount before a change; in a percent of change it is the whole, the number you divide by

ratio

a comparison of two amounts; part to part, 19 : 31 means 19 of every 19 + 31 = 50, and 19 ÷ 50 = 38% of the whole

Notes

I. Circle graphs

The sectors total 100%, and their angles total 360°.

A count is the percent of the total: 40% of 70 is $0.40 \cdot 70 = 28$

An angle is the fraction of 360°: 15 of 60 is $\frac{15}{60} \cdot 360 = 15 \cdot 6 = 90$, so 90°

To draw one: every angle, check 360°, then lines at the running totals from 0°.

Never the percent read as degrees: 25% of the circle is 90°, not 25°.

A percent from an angle: the angle ÷ 360, then · 100.

Notes

II. Percent problems: the percent as a decimal, times the amount

A discount: take off the discount, or pay what is left (15% off: pay 85%).

Tax, tip or fee: add the charge, or multiply by 1 plus the rate (6%: 1.06).

Percents in a row are not added: each is taken of the new amount.

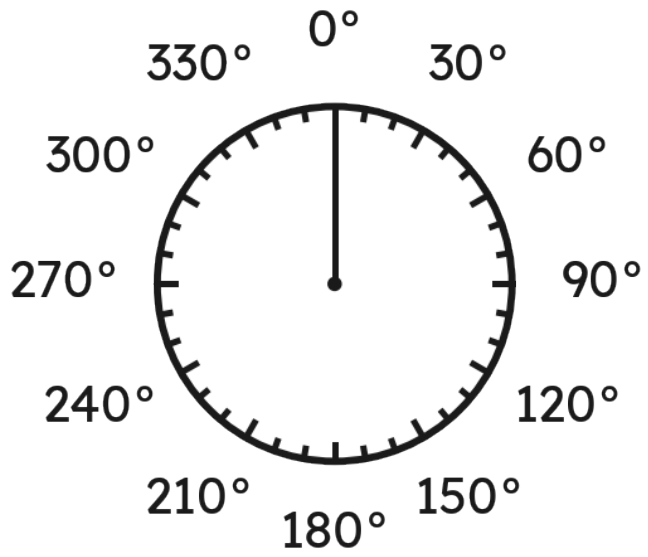
Printed on the test	The formula
Simple interest	$I = Prt$
Percent of change	$(\text{final} - \text{initial}) \div \text{initial} \cdot 100$
Percent error	$\lvert\text{estimate} - \text{actual}\rvert \div \text{actual} \cdot 100$

Example 1

18 volunteers each chose one job at the fair.

Find each central angle. Then draw the circle graph.

Job	Volunteers
Tickets	7
Games	5
Food	4
Cleanup	2



Example 1

$$\frac{7}{18} \cdot 360 = 7 \cdot 20 = 140 \qquad \frac{5}{18} \cdot 360 = 5 \cdot 20 = 100$$

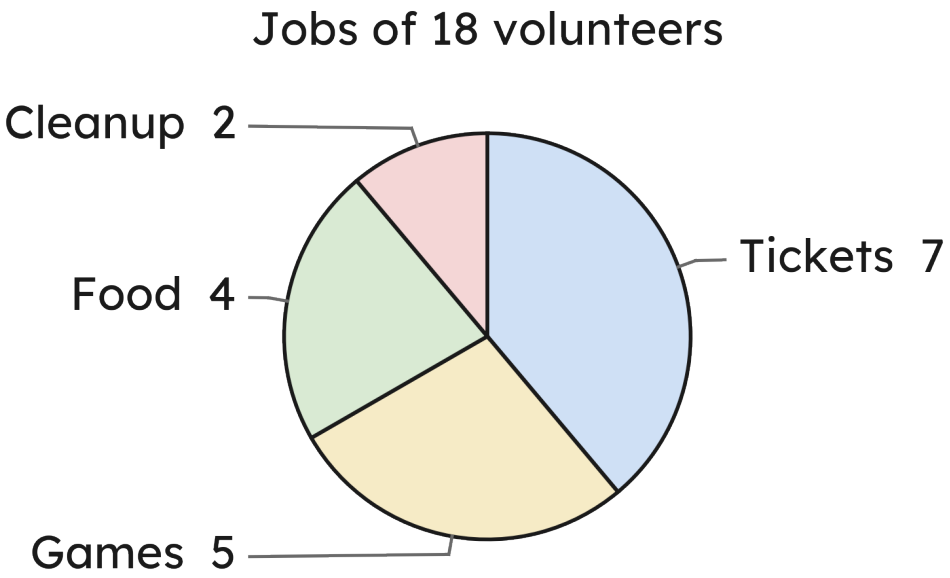
$$\frac{4}{18} \cdot 360 = 4 \cdot 20 = 80 \qquad \frac{2}{18} \cdot 360 = 2 \cdot 20 = 40$$

$$140 + 100 + 80 + 40 = 360$$

Answer: Tickets 140°, Games 100°, Food 80°, Cleanup 40°

Example 1

Where does each line go?



$0 + 140 = 140$

$140 + 100 = 240$

$240 + 80 = 320$

$320 + 40 = 360$

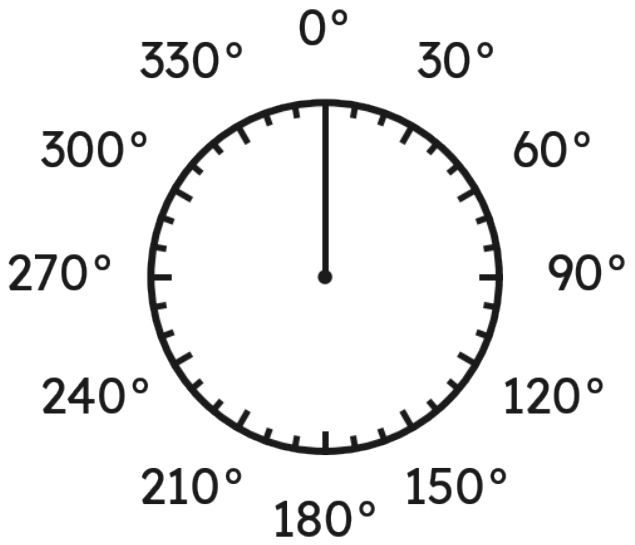
Answer: Lines at 0°, 140°, 240° and 320°

Your Turn

18 students each chose a favorite booth.

Find each central angle. Then draw the circle graph on your circle.

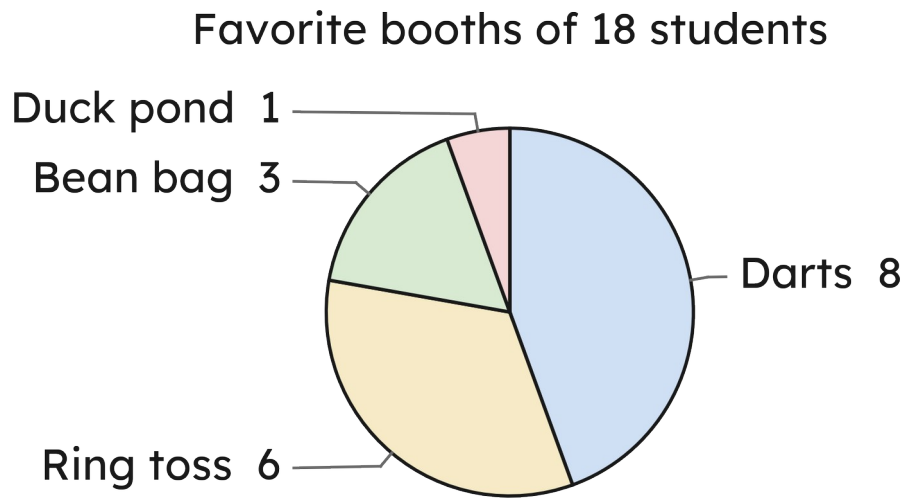
Booth	Students
Darts	8
Ring toss	6
Bean bag	3
Duck pond	1



Your Turn

18 students each chose a favorite booth.

Find each central angle. Then draw the circle graph on your circle.



Darts: $\frac{8}{18} \cdot 360 = 8 \cdot 20 = 160$

Ring toss $6 \cdot 20 = 120$

Bean bag $3 \cdot 20 = 60$

Duck pond $1 \cdot 20 = 20$

Lines at 0°, 160°, 280°, 340°

Answer: 160°, 120°, 60°, 20°

Example 2

A fair T-shirt costs $24. It is 25% off, and a 6% sales tax is charged on the sale price.

Find the total.

Example 2

$0.75 \cdot 24 = 18$

$1.06 \cdot 18 = 19.08$

Answer: $19.08

Your Turn

A fair hoodie costs $44. It is 25% off, and a 7% sales tax is charged on the sale price.

Find the total.

Your Turn

A fair hoodie costs $44. It is 25% off, and a 7% sales tax is charged on the sale price.

Find the total.

Sale price: $0.75 \cdot 44 = 33$

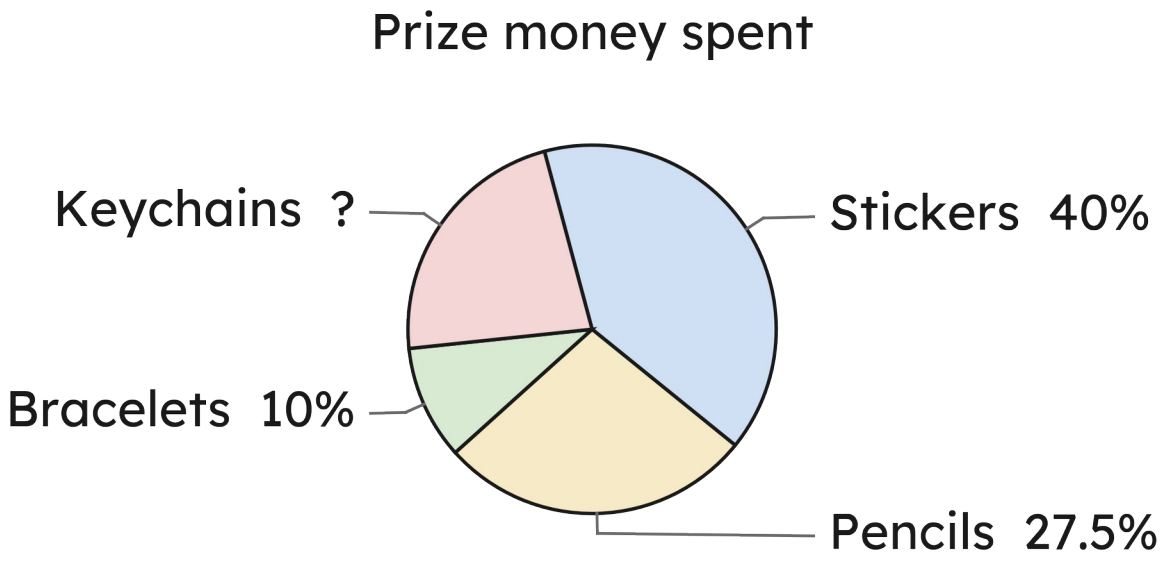
Total: $1.07 \cdot 33 = 35.31$

Answer: $35.31

Whiteboards · Question 1 of 9

The fair spent $120 on prizes.

What percent went to keychains, and how many dollars?

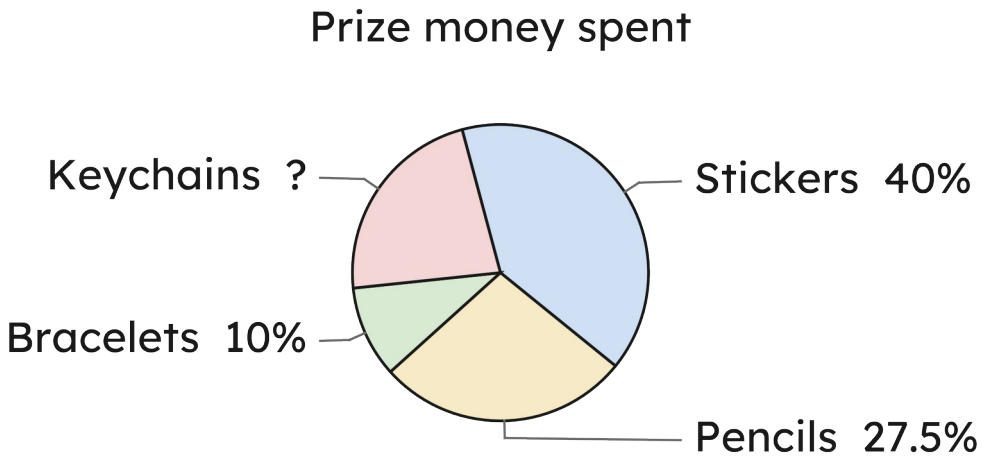


Answer it.

Whiteboards · Question 1 of 9

The fair spent $120 on prizes.

What percent went to keychains, and how many dollars?



Percent: $100 - 40 - 27.5 - 10 = 22.5$

Dollars: $0.225 \cdot 120 = 27$

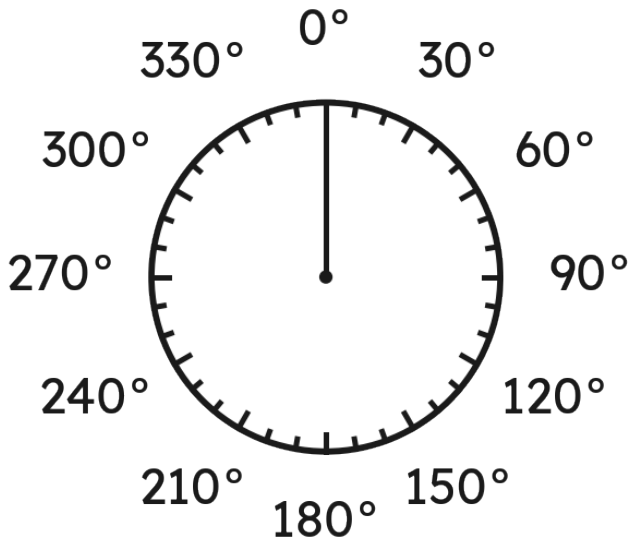
Answer: 22.5%; $27

Whiteboards · Question 2 of 9

24 students voted for the fair's theme.

Find Ocean's central angle. Draw the graph on your circle.

Theme	Votes
Space	10
Ocean	8
Jungle	4
Castle	2

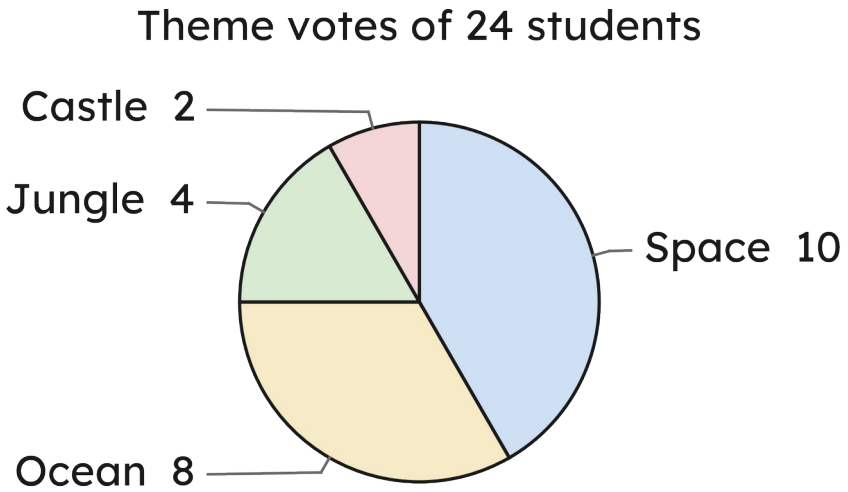


Answer it.

Whiteboards · Question 2 of 9

24 students voted for the fair's theme.

Find Ocean's central angle. Draw the graph on your circle.



Ocean: $\frac{8}{24} \cdot 360 = 8 \cdot 15 = 120$

Space $10 \cdot 15 = 150$, Jungle $4 \cdot 15 = 60$

Castle $2 \cdot 15 = 30$

Lines at 0°, 150°, 270°, 330°

Answer: Ocean 120°

Whiteboards · Question 3 of 9

Both booths' circle graphs show 30% stuffed animals.

Booth A gave out 40 prizes. Booth B gave out 70.

Which is true about their stuffed animals?

A. The same number

B. 9 more at Booth B

C. 9 more at Booth A

D. 21 more at Booth B

Answer it.

Whiteboards · Question 3 of 9

Both booths' circle graphs show 30% stuffed animals.

Booth A gave out 40 prizes. Booth B gave out 70.

Which is true about their stuffed animals?

Booth A: $0.30 \cdot 40 = 12$ Booth B: $0.30 \cdot 70 = 21$

$21 - 12 = 9$: 9 more at Booth B

Answer: B — 9 more at Booth B

Whiteboards · Question 4 of 9

A canopy's regular price is $86 at two stores.

Store A takes 45% off.

Store B takes 25% off, then 20% off the sale price.

Which store is cheaper, and by how many dollars?

Answer it.

Whiteboards · Question 4 of 9

A canopy's regular price is $86 at two stores.

Store A takes 45% off.

Store B takes 25% off, then 20% off the sale price.

Which store is cheaper, and by how many dollars?

Store A: $0.55 \cdot 86 = 47.30$

Store B: $0.75 \cdot 86 = 64.50$, then $0.80 \cdot 64.50 = 51.60$

$51.60 - 47.30 = 4.30$: Store A is cheaper

Answer: A $47.30, B $51.60: Store A, by $4.30

Whiteboards · Question 5 of 9

A booth buys 30 puzzles at $18 each and marks them up 45%.

What is the selling price of one puzzle?

A. $8.10

B. $63

C. $9.90

D. $26.10

Answer it.

Whiteboards · Question 5 of 9

A booth buys 30 puzzles at $18 each and marks them up 45%.

What is the selling price of one puzzle?

Markup: $0.45 \cdot 18 = 8.10$

Selling price: $18 + 8.10 = 26.10$, or $1.45 \cdot 18 = 26.10$

Answer: D — $26.10

Whiteboards · Question 6 of 9

A booth's fee is 14% of its sales, and the fee is $20.30.

How much were the booth's sales?

Answer it.

Whiteboards · Question 6 of 9

A booth's fee is 14% of its sales, and the fee is $20.30.

How much were the booth's sales?

$$0.14s = 20.30$$

$$s = 20.30 \div 0.14 = 145$$

Answer: $145

Whiteboards · Question 7 of 9

Simple interest: $I = Prt$

A savings fund holds $2,500 at 2.4% simple interest per year.

What are the interest and the balance after 3 years?

Answer it.

Whiteboards · Question 7 of 9

Simple interest: $I = Prt$

A savings fund holds $2,500 at 2.4% simple interest per year.

What are the interest and the balance after 3 years?

$$\text{Interest: } 2{,}500 \cdot 0.024 \cdot 3 = 180$$

$$\text{Balance: } 2{,}500 + 180 = 2{,}680$$

Answer: Interest $180; balance $2,680

Whiteboards · Question 8 of 9

Everyone at the fair was an adult or a student, in the ratio 21 : 29.

What percent of the people were adults?

Answer it.

Whiteboards · Question 8 of 9

Everyone at the fair was an adult or a student, in the ratio 21 : 29.

What percent of the people were adults?

The whole: $21 + 29 = 50$, so 21 of every 50 people are adults

$21 \div 50 = 0.42$, and $0.42 \cdot 100 = 42$

Answer: 42%

Whiteboards · Question 9 of 9

46% of the visitors came by bus.

Jo wrote the ratio of bus to not-bus as 46 : 100.

What did Jo do wrong? Write the right ratio.

Write your answer in sentences.

Whiteboards · Question 9 of 9

46% of the visitors came by bus.

Jo wrote the ratio of bus to not-bus as 46 : 100.

What did Jo do wrong? Write the right ratio.

100 is every visitor: the whole, not the other part

Not bus: 100 – 46 = 54; 46 : 54 = 23 : 27 (divide both by 2)

Answer: Jo used the whole; 46 : 54, or 23 : 27

Independent Practice

1. In a circle graph of the fair's ticket sales, one sector's central angle is 207°. What percent of the tickets does that sector show?

2. Simple interest: I = Prt. $460 earns $138 at 5% simple interest per year. For how many years?

3. Percent of change = (final − initial) ÷ initial · 100. The fair sold 140 raffle tickets last year and 196 this year. Find the percent increase.

4. Percent of change = (final − initial) ÷ initial · 100. A fair pass cost $55 last year. This year it costs $37.40. Find the percent decrease.

5. After a 30% price cut, a wristband costs $10.50. What was the price before the cut?

6. Percent error = |estimate − actual| ÷ actual · 100. Ava guessed 357 jelly beans were in the raffle jar. There were 420. Find her percent error.

Before You Go

An angle is the fraction of 360°; the lines go at the running totals.

Percents in a row are not added; in a part-to-part ratio the whole is the sum of the parts.

Tomorrow and Wednesday: the test, over two class periods.

IXL

1. Open IXL and start today's skills.
2. Work on paper where the question needs work. The answer box does not show it.
3. Every skill listed is required, to a SmartScore of 60. Every Unit 7 skill is due by the test: bring any still under 60 up to it.

Today's skills — all required

Interpret circle graphs (WNJ)

Multi-step problems with percents (ZHX)