

Shapes and Data Displays: practice solutions, Grade 3 – download the PDF

Written solutions to the chapter problems. Check each step, then correct yourself.

1 Name that quadrilateral



- a. A **square**: equal sides and right angles.
- b. A **rectangle**: it has right angles, but its sides are not all equal.
- c. A **rhombus**: its sides are equal but it has no right angle.

2 Find the quadrilaterals



A quadrilateral has exactly 4 sides. The rectangle, the rhombus, the square and the trapezoid have 4 sides. The triangle (3), the pentagon (5) and the hexagon (6) do not.

There are **4 quadrilaterals**.

3 Sandwich fourths



- a. The sandwich has 4 equal parts, so each piece is one **fourth**, written $\frac{1}{4}$.
- b. Her brother eats 3 pieces of 4 equal pieces: $\frac{3}{4}$ of the sandwich.

4 Favorite sports picture graph



- a. Soccer has 3 circles. $3 \times 4 = 12$ votes.
- b. Tennis has only 1 circle (4 votes), so tennis got the **fewest**.
- c. $12 - 4 = 8$. Soccer got **8 more votes**.

5 Measure the crayon



The crayon starts at 0 and ends 3 small marks after the 1 inch mark. Each small mark is $\frac{1}{4}$ inch.

The crayon is $1\frac{3}{4}$ inches long.

6 Bean line plot



- a. $2 + 3 + 4 + 1 = 10$ beans.
- b. There are 4 X marks at 1 inch and 1 at $1\frac{1}{4}$ inches: $4 + 1 = 5$ beans.
- c. The last X is above $1\frac{1}{4}$, so the longest length is $1\frac{1}{4}$ inches.

7 True or false?



- a. **True.** A square has 4 right angles.
- b. **False.** A rectangle that is 5 cm by 2 cm is not a square.
- c. **True.** A square has 4 equal sides.
- d. **False.** A slanted rhombus has no right angles.

8 A rhombus with 5 cm sides



- a. All 4 sides are equal, so it is a **rhombus**.
- b. $5 + 5 + 5 + 5 = 20$. The perimeter is **20 cm**.
- c. No. A square needs 4 right angles, and this shape has none.

9 Garden rectangle



- a. In a rectangle, opposite sides are equal: the two long sides are 9 feet and the two short sides are 4 feet.
- b. $9 + 4 + 9 + 4 = 26$. The distance around is **26 feet**.

10 Sorting by attributes



4 right angles: **P and Q**.

4 equal sides: **P and R**.

Neither: **S**. The square P is in both groups.

11 Pizza sixths



a. Each piece is $\frac{1}{6}$.

b. Two pieces: $\frac{2}{6}$.

c. $6 - 2 = 4$ pieces are left: $\frac{4}{6}$.

12 Are these thirds?



He is **not right**. The parts have different widths, so they are not equal. Thirds must be 3 **equal** parts. The rectangle must be cut so that A, B and C have the same width.

13 Boxes recycled



- a. The tallest bar is Tuesday, with **50** boxes.
- b. $30 + 50 + 20 + 40 + 10 = 150$ boxes.
- c. Wednesday has 20. Twice 20 is 40, which is **Thursday**.

14 Fruit stand picture graph



A half circle stands for 2 fruits.

- Apples: $14 = 4 + 4 + 4 + 2$, so 3 circles and 1 half circle.
- Pears: $6 = 4 + 2$, so 1 circle and 1 half circle.
- Plums: $10 = 4 + 4 + 2$, so 2 circles and 1 half circle.

15 Two ribbons



The red ribbon is $2\frac{1}{4}$ inches, which is 9 quarter inches. The blue ribbon is 7 quarter inches.

$9 - 7 = 2$ quarter inches, and 2 quarters is $\frac{1}{2}$ inch. The red ribbon is $\frac{1}{2}$ inch longer.

16 Pencil line plot



a. $\frac{1}{2}$ inch: 2 pencils. $\frac{3}{4}$ inch: 1 pencil. 1 inch: 3 pencils. $1\frac{1}{2}$ inches: 2 pencils. Total $2 + 1 + 3 + 2 = 8$, which matches.

b. 3 X marks above 1.

c. Lengths less than 1 inch are $\frac{1}{2}$ (2 pencils) and $\frac{3}{4}$ (1 pencil): $2 + 1 = 3$ pencils.

17 Reading a scaled bar graph



- a. $7 \times 5 = 35$. The Tigers have **35**.
- b. The Hawks bar is on the 4th line: $4 \times 5 = 20$. The Hawks have **20**.
- c. $55 \div 5 = 11$, so it is the **11th line**.

18 Rhombus or square?



The shape has 4 equal sides, but its corners are slanted. It is a **rhombus**, not a square. So 4 equal sides is not enough.

A square also needs **4 right angles**.

19 Mystery shapes



- a. All angles are right angles, so it is a rectangle. The sides are not all equal, so it is a **rectangle that is not a square**.
- b. Equal sides and no right angles: a **rhombus**. Perimeter: $4 \times 6 = 24$ inches.

20 Two ways to cut a square



- a. Yes. Both squares are cut into 4 equal parts, so each shaded part is $\frac{1}{4}$. The parts have different shapes but the same size.
- b. The area of the square is $8 \times 8 = 64$ square inches. $64 \div 4 = 16$, so each shaded part has an area of **16 square inches**.

21 Hiking trails



- a. $35 + 20 + 15 + 40 = 110$ hikers.
- b. $40 - 15 = 25$ more hikers.
- c. $15 + 10 = 25$, and $25 = 10 + 10 + 5$. Draw 2 circles and 1 half circle.

22 Leaf collection



- a. $1 + 3 + 5 + 3 + 2 = 14$ leaves.
- b. Longer than $1\frac{1}{2}$: $1\frac{3}{4}$ (3 leaves) and 2 (2 leaves), so $3 + 2 = 5$ leaves.
- c. The longest leaf is 2 inches and the shortest is 1 inch. $2 - 1 = 1$. The difference is 1 inch.



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