Secondary 1 Mathematics · Practice Worksheet · tutorinmontreal.ca

Perimeter, Area and Units of Measurement

Name: _____ Date: _____

Concepts

- Constructing a Circle
- Decomposable Geometric Figures
- Finding Missing Measurements in Plane Figures From the Perimeter
- Methods to Decompose Figures
- Missing Measurements in Plane Figures (theory)
- The Arcs and Sectors of a Circle
- The Area and the Perimeter of Triangles
- The Perimeter and The Area of Decomposable Figures
- The Perimeter and the Area of Plane Figures
- The Perimeter and the Area of Quadrilaterals
- The Perimeter and the Area of Regular Polygons - Secondary 1 and 2
- Units for Measuring Mass and Their Conversion
- Units of Length
- Units of Time and Their Conversion

Constructing a Circle

1. Zoe opens her compass to 4.5 cm and draws a circle on her poster.

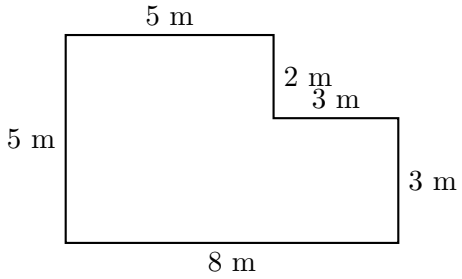
a) Give the radius and the diameter of her circle.

b) She then draws a chord that measures exactly 9 cm. What is this chord called, and explain why no chord of her circle can be longer than 9 cm.

c) Find the circumference of the circle, first as an exact multiple of π and then as a decimal (use $\pi \approx 3.14$).

Decomposable Geometric Figures

2. The floor of a storage room at an arena is shaped like the letter L.



a) Describe two *different* ways of cutting this floor into rectangles, giving the dimensions of each piece.

b) Find the area of the floor with both of your decompositions, and check that they agree.

c) The segment you drew to cut the figure does not appear anywhere in the perimeter of the room. Explain why.

Finding Missing Measurements in Plane Figures From the Perimeter

3.

a) An isosceles triangular banner has a perimeter of 74 cm. Its base measures 24 cm. Find the length of each of the two equal sides.

b) A rectangular window has a perimeter of 74 cm and a width of 16 cm. Find its length.

c) In one sentence, say what is the same about the first step of the two solutions.

Methods to Decompose Figures

4. A workshop tabletop is a rectangle 120 cm long and 80 cm wide, with a semicircular bite of diameter 80 cm cut out of one of the short ends.

a) Would you find this area by *addition* (cutting into pieces) or by *subtraction* (removing a piece from a bigger figure)? Say why.

b) Find the area of the tabletop, to the nearest square centimetre. Use $\pi \approx 3.14$.

Missing Measurements in Plane Figures

5. For each situation below, first say whether the measurement you are given is a *perimeter* or an *area*, then name the relation you will undo, and only then find the missing measurement.

a) A parallelogram has an area of 96 cm^2 and a base of 12 cm. Find its height.

b) A rectangle has a perimeter of 30 cm and a length of 9 cm. Find its width.

c) A triangle has an area of 45 cm^2 and a height of 9 cm. Find its base.

The Arcs and Sectors of a Circle

6. A round pizza of radius 18 cm is cut into slices. One slice is a sector with a central angle of 40°. Give each answer as an exact multiple of π and then as a decimal, using $\pi \approx 3.14$.

a) Find the length of the crust on that slice (the arc).

b) Find the area of the slice.

c) Find the perimeter of the slice. Be careful — it is not the same as your answer to (a).

The Area and the Perimeter of Triangles

7. A triangular flower bed sits in the corner of a park. Its three sides measure 9 m, 12 m and 15 m, and the corner where the 9 m and 12 m sides meet is a right angle.

a) Find the area of the flower bed.

b) Find its perimeter.

c) Metal edging costs \$8.50 per metre. Find the cost of edging the whole bed.

The Perimeter and The Area of Decomposable Figures

8. A community-centre window is shaped like a rectangle 2.4 m wide and 1.8 m tall with a semicircle sitting on top of it, the flat side of the semicircle being the top of the rectangle. Use $\pi \approx 3.14$ and round each answer to the nearest hundredth.

a) Find the area of the glass.

b) Find the perimeter of the window frame that goes round the outside of the glass.

The Perimeter and the Area of Plane Figures

9. Read each set of measurements carefully — one of them mixes two units.

a) A toy kite is shaped like a rhombus. Its diagonals measure 48 cm and 0.2 m, and each of its four sides measures 26 cm. Find its area and its perimeter, in centimetres.

b) A wooden deck is a trapezoid. Its two parallel sides measure 10 m and 4 m, the distance between them is 4 m, and its two slanted sides each measure 5 m. Find its area and its perimeter.

The Perimeter and the Area of Quadrilaterals

10. A parallelogram-shaped banner has a base of 1.2 m. Its two slanted sides each measure 60 cm, and the perpendicular distance between the base and the side opposite it is 45 cm.

a) Find the area of the banner in cm^2.

b) Find its perimeter, in centimetres and then in metres.

c) The 60 cm slanted side is not the number used in the area formula. Explain why not.

The Perimeter and the Area of Regular Polygons — Secondary 1 and 2

11.

a) A paving stone is a regular hexagon with sides of 8 cm and an apothem of 6.9 cm. Find its perimeter and its area.

b) A blank metal plate is a regular octagon with sides of 15 cm and an apothem of 18.1 cm. Find its perimeter and its area.

c) In your own words, say what the apothem of a regular polygon is.

Units for Measuring Mass and Their Conversion

12. A factory packs granola bars. Each bar has a mass of 45 g, a carton holds 24 bars, and the empty carton itself has a mass of 180 g.

a) Find the mass of a full carton, in grams and then in kilograms.

b) A pallet holds 500 full cartons. Find its mass in kilograms and then in tonnes.

c) A vitamin tablet has a mass of 250 mg. How many tablets would it take to match the mass of one granola bar?

Units of Length

13.

a) Put these five lengths in order from smallest to largest, converting them all to metres first: 4500 mm, 0.004 km, 45 cm, 4.5 dm, 0.9 m. Two of them are equal — say which.

b) A hallway is 12.5 m long. Floor tiles are 25 cm wide. How many tiles fit in one row along the hallway?

Units of Time and Their Conversion

14.

a) Convert 2 h 45 min to minutes, and convert 500 s to minutes and seconds.

b) A hockey tournament starts its first game at 8:15. Each game lasts 1 h 25 min, and the ice is resurfaced for 10 min between games. At what time does the third game end?

Synthesis — drawing on several sheets in this topic

15. A new concrete skatepark pad is a rectangle 12 m by 7 m, with one corner rounded off: a quarter-circle of radius 4 m has been cut away from that corner. Use $\pi \approx 3.14$.

a) Find the area of the pad, to the nearest hundredth of a square metre.

b) Find the perimeter of the pad, to the nearest hundredth of a metre.

c) Rubber edging is sold only in straight 2.5 m lengths that can be bent round the curve. How many lengths must the town buy?