ELMACON Prep #2: Geometry

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SFU

2026

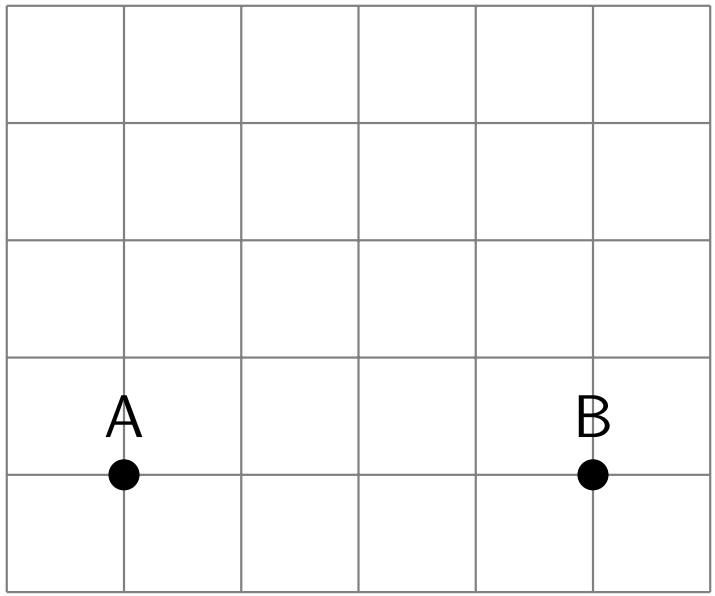
Geometry

Geometry: "Earth measure"

- Measuring
- Shapes
  -
  -
  -
- Size
  -
  -
  -

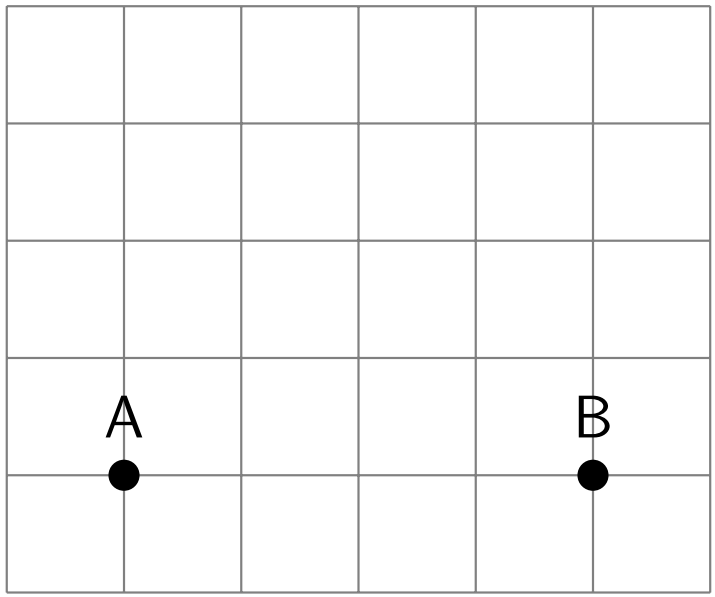
Distance

How far apart are points A and B?



Distance

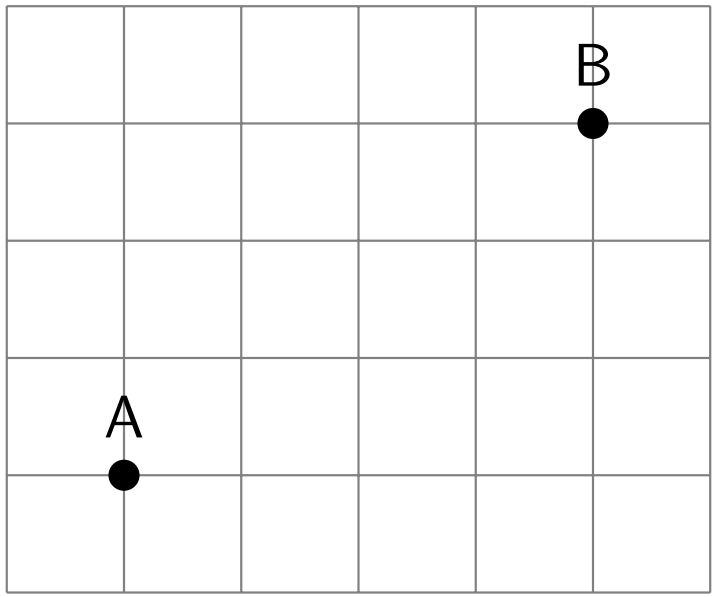
1. How far apart are points A and B?



The measure of the side of each of the small squares is 1 cm.

Distance

2. How far apart are points A and B?



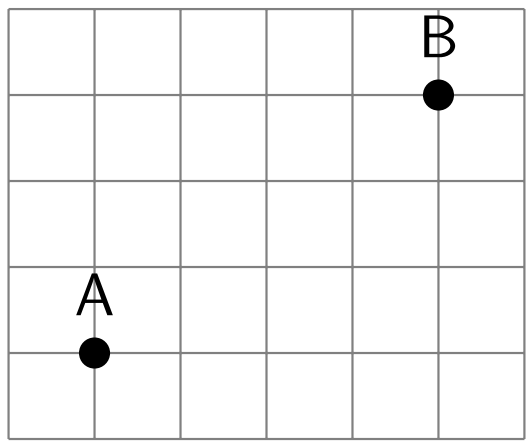
The measure of the side of each of the small squares is 1 unit.

The distance formula

The distance between two points is found by:

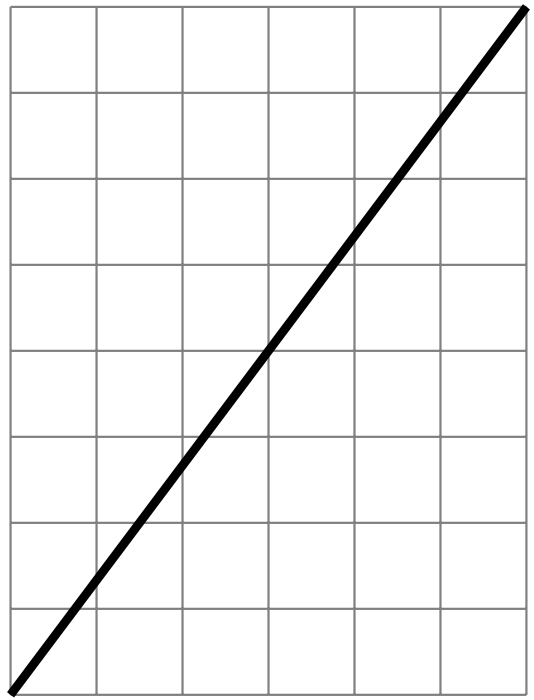
$$\sqrt{(\text{horizontal distance})^2 + (\text{vertical distance})^2}$$

Example.



Example.

3. The measure of the side of each of the small squares is 1 unit.

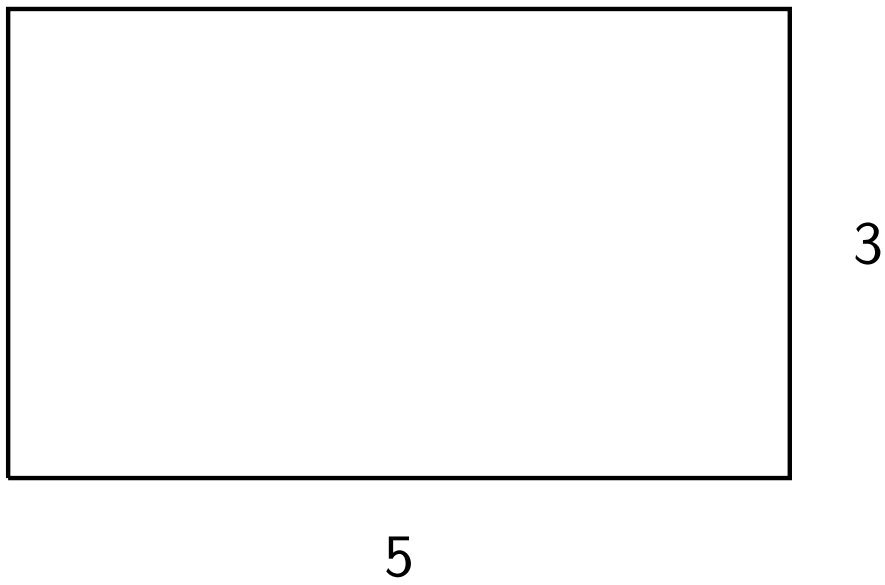


What is the measure of the bold line?

Perimeter

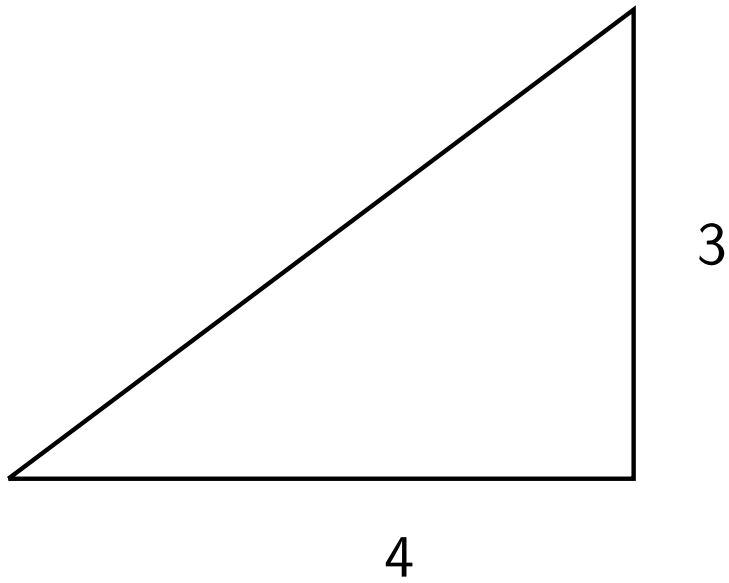
Perimeter: the distance around a shape.

4. **Example.** What is the perimeter of the following rectangle?



Perimeter

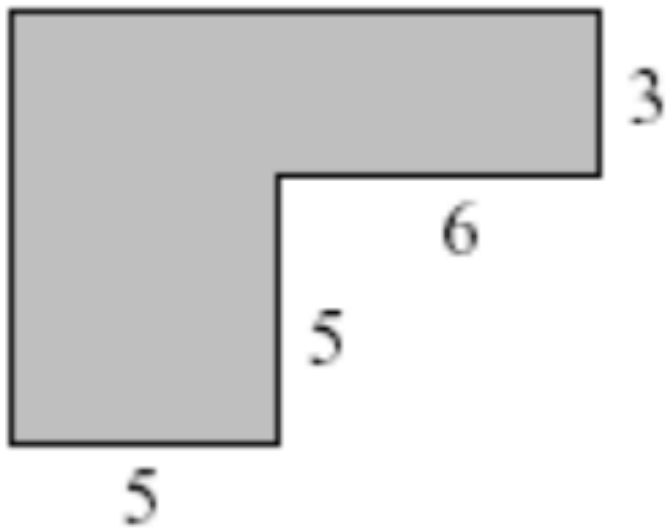
5. **Example.** What is the perimeter of the following triangle?



(angles that look like right angles are right angles)

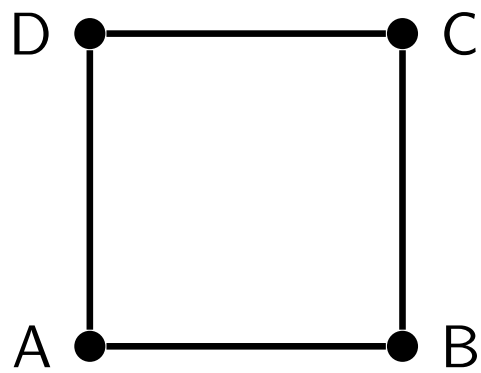
Perimeter

6. **Practice** All angles of the shape below are right angles. What is the perimeter of the shape?



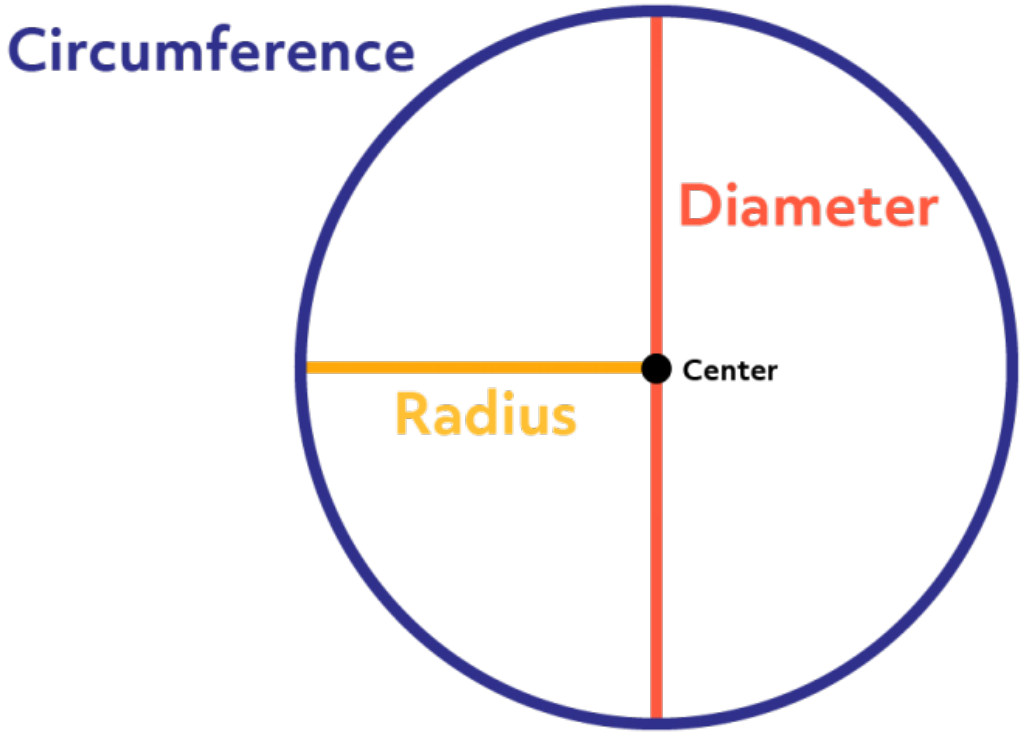
Perimeter

7. **Practice** The perimeter of the square $ABCD$ is 36.



What is one side length of the square?

Circles



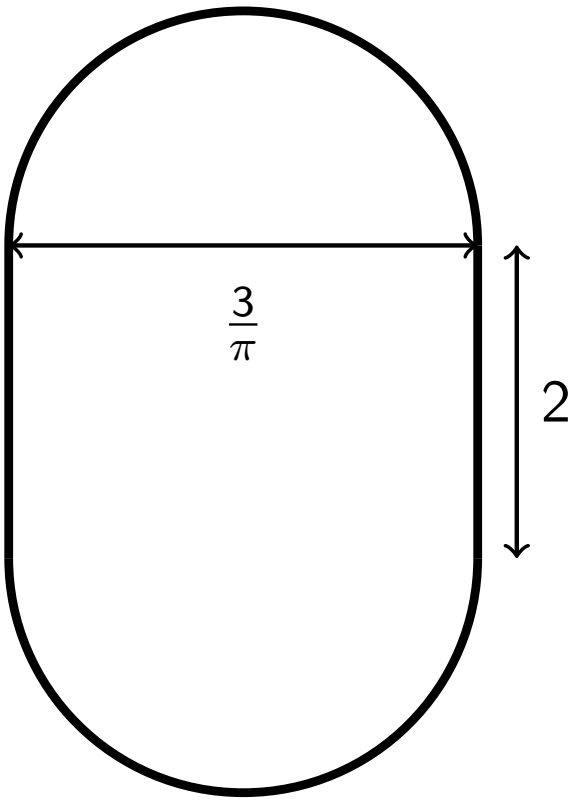
$$\pi =$$

Circles

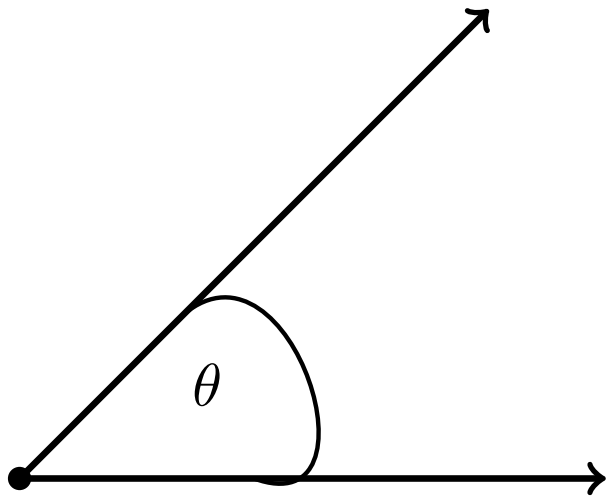
8. **Example.** The radius of a circle is $\frac{18}{\pi}$. What is the circumference of the circle?

Circles

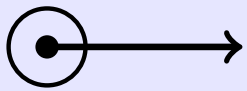
9. **Practice.** Determine the perimeter of the following figure.



Angles



Big Important Agreed Upon Definition: For historical reasons, the angle measured between a ray and itself (all the way around) is 360° ('degrees').

$\theta = 360^\circ$ 

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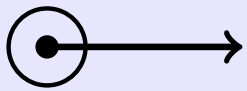
$\theta = 360^\circ$ 

Question: How many degrees make up a 'straight' angle?

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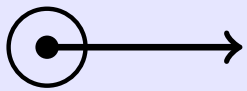
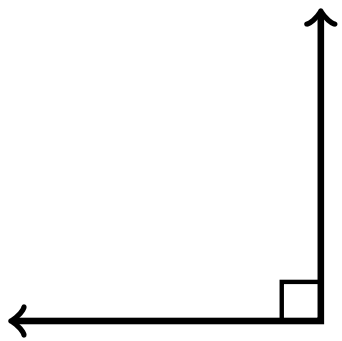
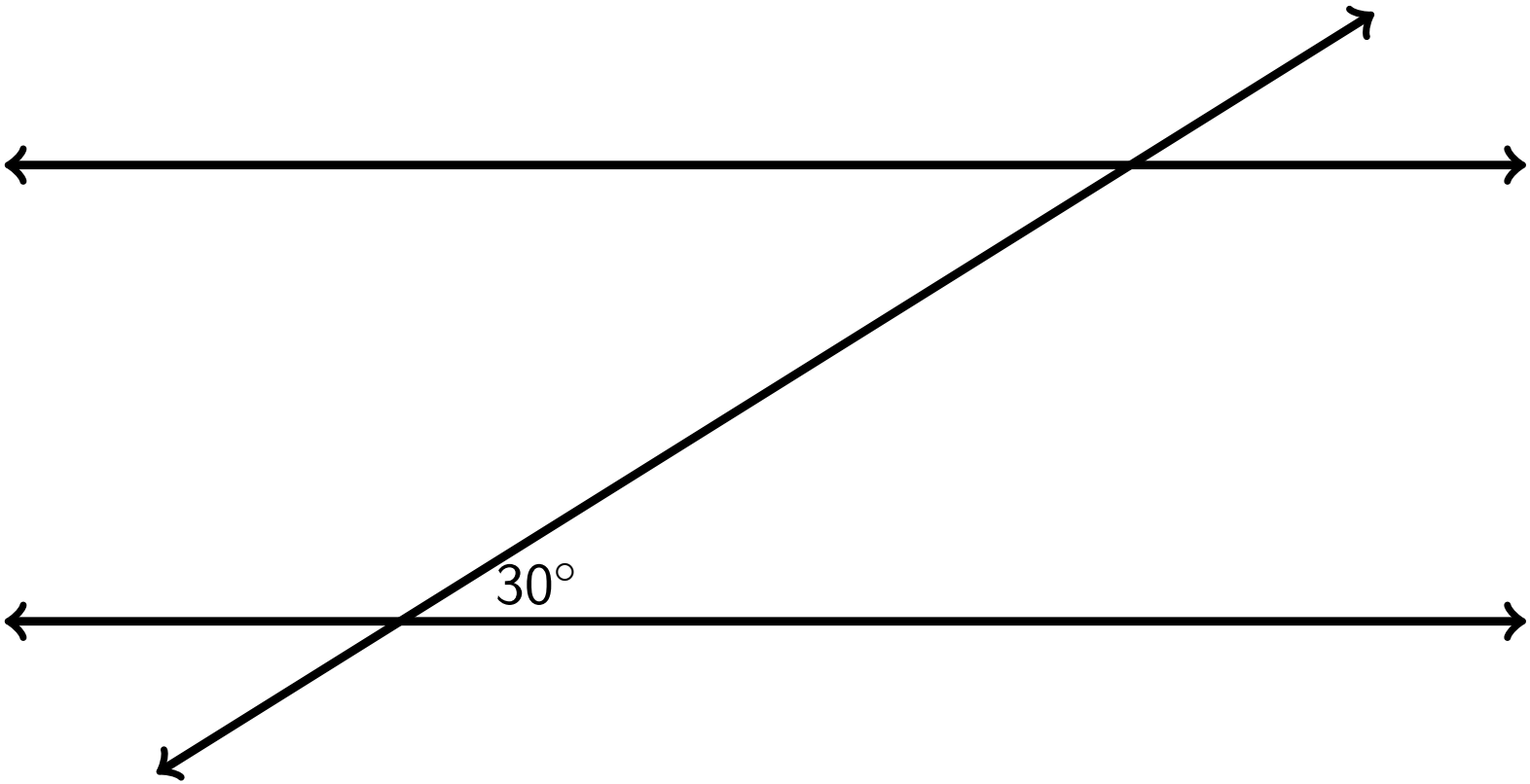
$\theta = 360^\circ$ 

Question: How many degrees make up a **right** angle?



Angles

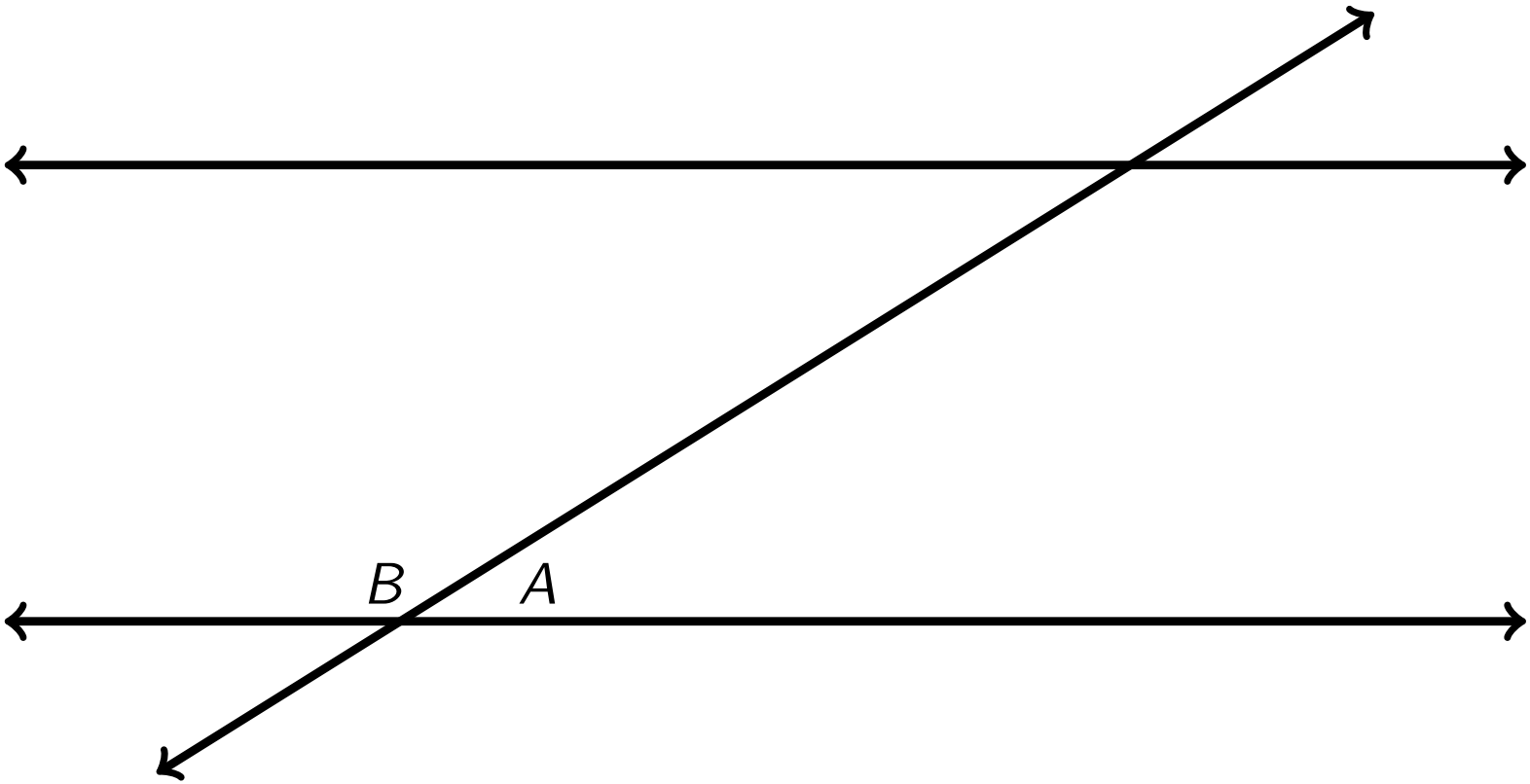
10a. The two lines that look parallel are parallel.



What other angles can we determine in this diagram?

Angles

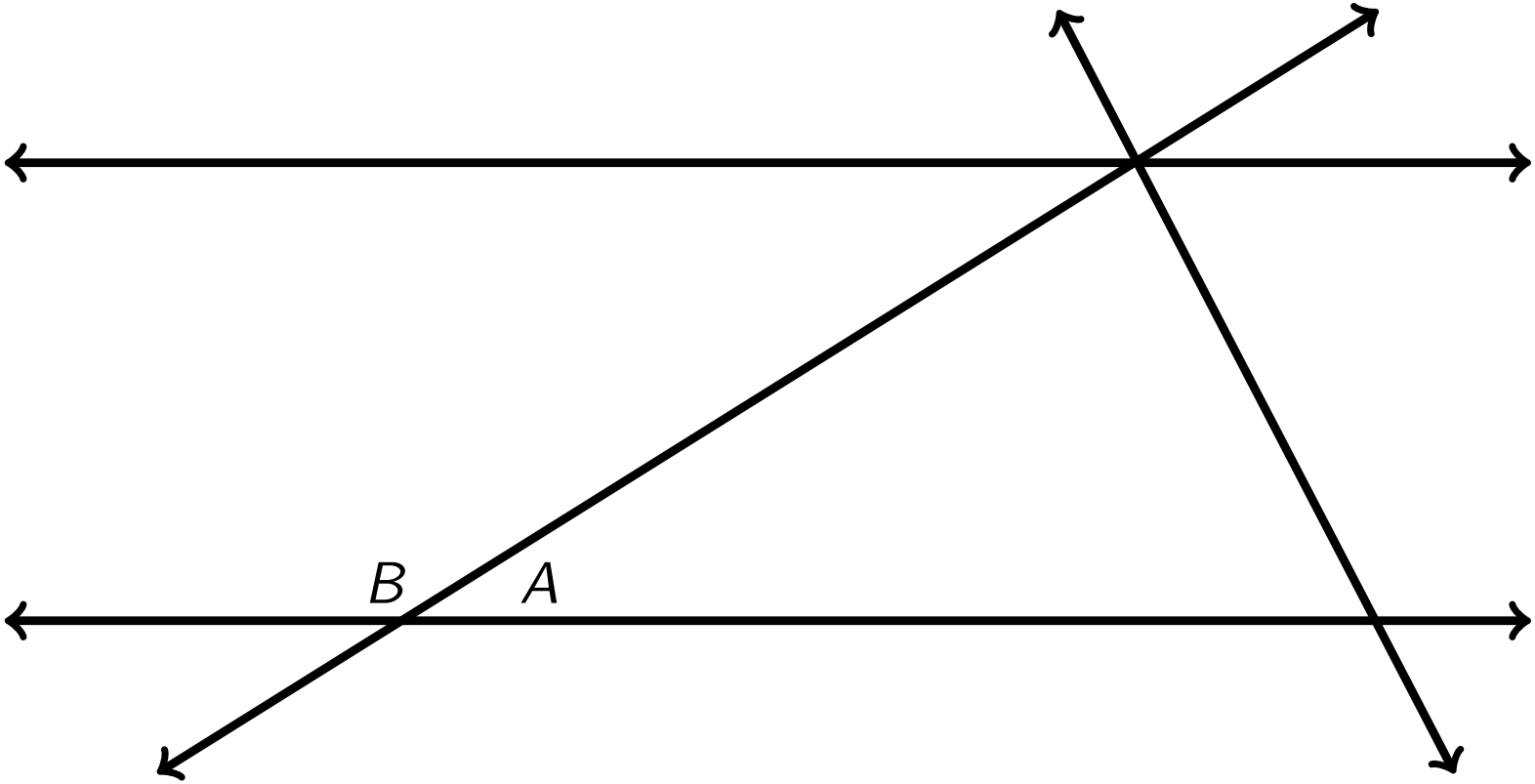
10b. The two lines that look parallel are parallel.



What other angles can we determine in this diagram?

Angles

10c. The two lines that look parallel are parallel.



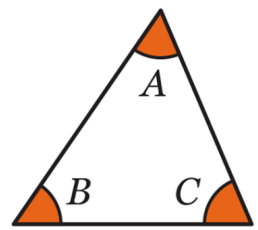
What other angles can we determine in this diagram?

Angles in triangles

Big important take-away: the angles in ANY triangle add up to 180° - *always!*

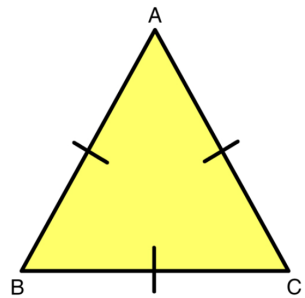
Angles

11. **Example.** In triangle ABC (not to scale) angle A is 30° and angle B is 70°. What is angle C?



Special triangles

Equilateral triangle: A triangle where all three sides are the same length and all three angles are equal.



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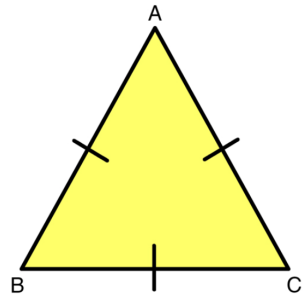
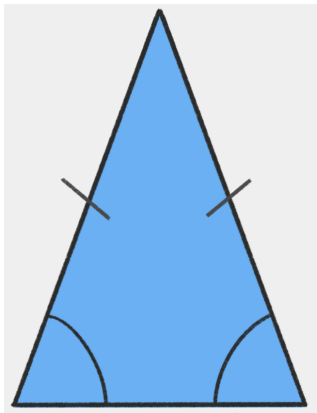
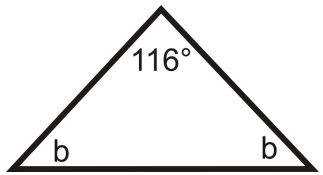


Isosceles triangle: A triangle where at least two sides are the same length.

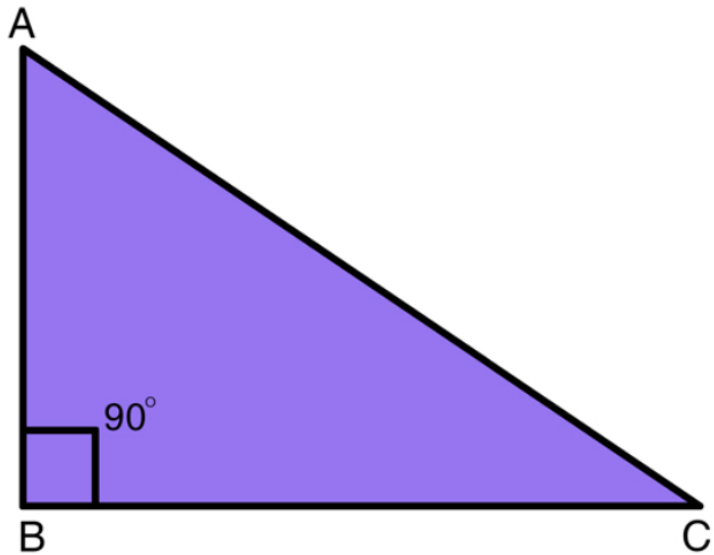


Special triangles

12. **Example.** Determine the missing angles:



Right triangle: A triangle with one right angle.



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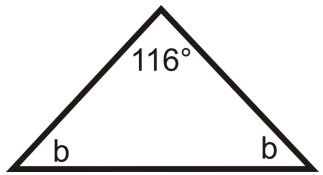

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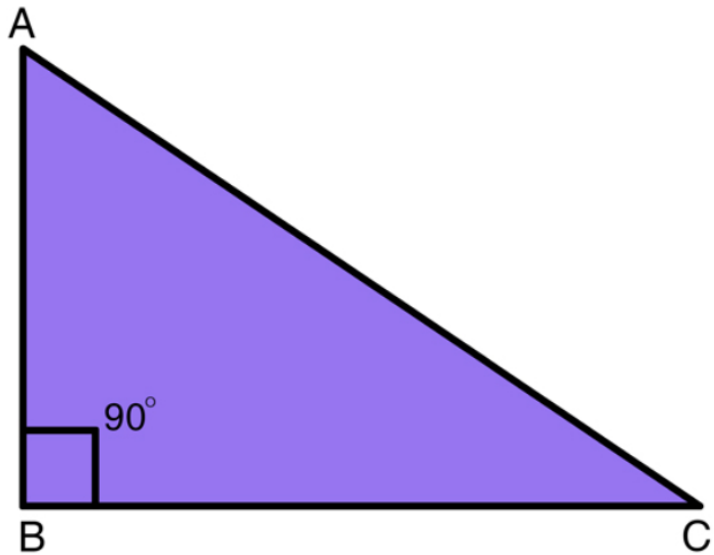
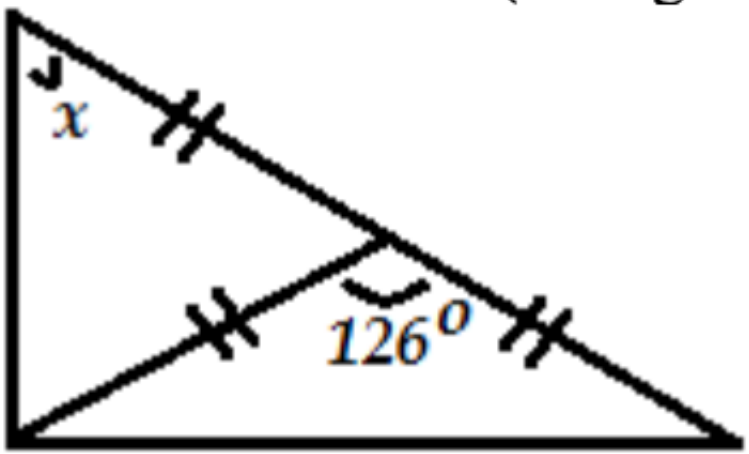


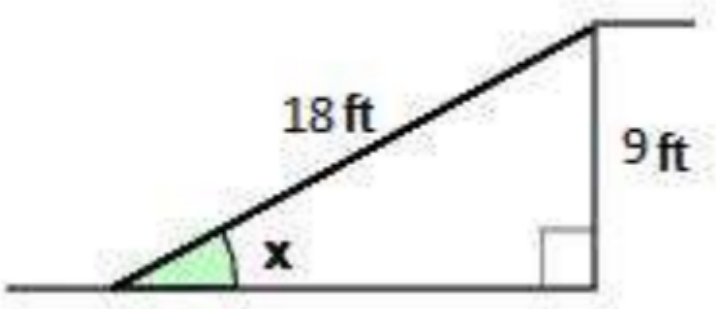
13. **Example.**

The right triangle below consists of 2 isosceles triangles. What is the value (in degrees) of the angle x?



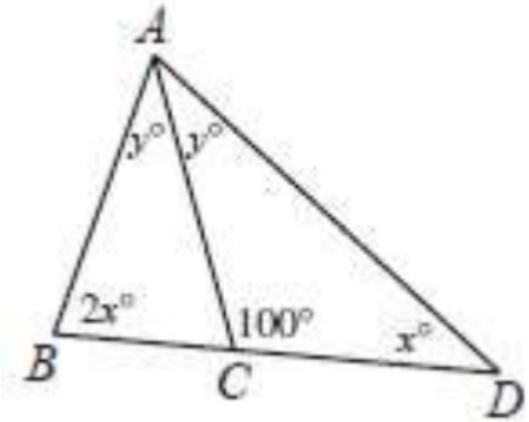
14. **Example.**

What is the value (in degrees) of the angle marked by the letter x?



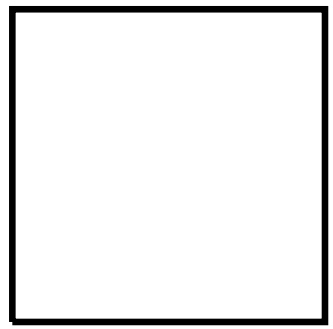
15. **Practice.**

x and y are measures of angles in ΔABC and ΔACD as shown below (the figure is not drawn to scale). What is the value of x (in degrees)?



Angles in other shapes

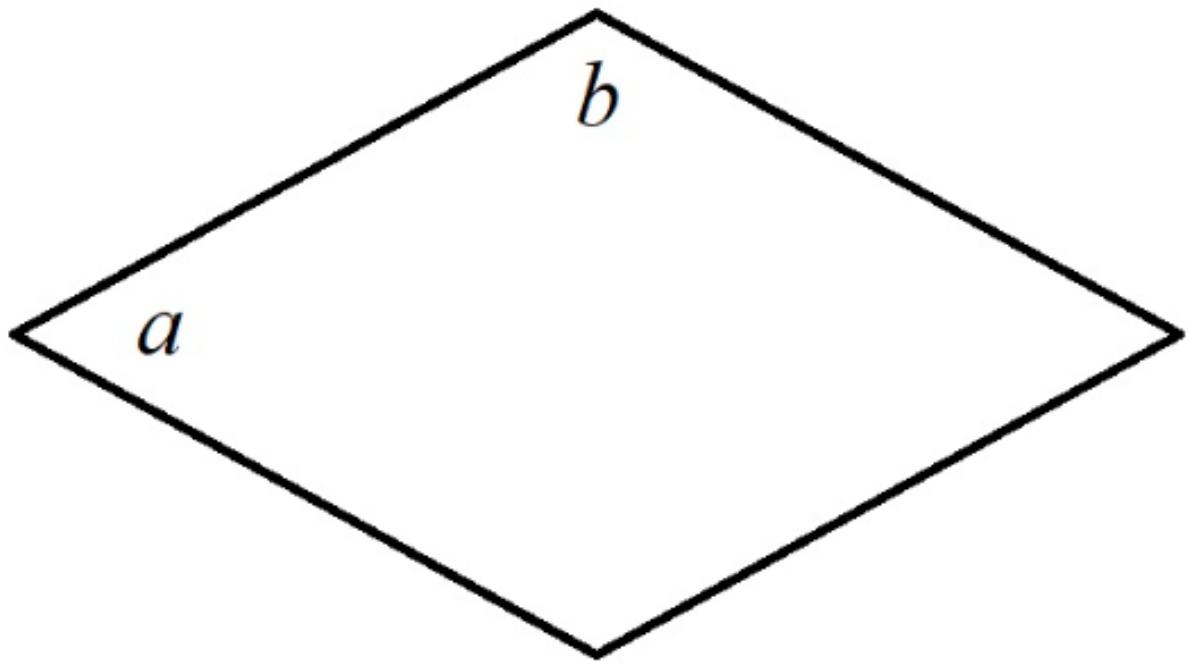
- What are the angles in a square? Their sum?



- What are the angles in a rectangle? Their sum?

Angles in other shapes

16. **Example.** Suppose the interior angle a of the rhombus shown below measures 32°. What is the measure of the angle b in degrees?



Angles in other shapes

What is the sum of the angles of *any* four sided polygon?

Angles in other shapes

What is the sum of the angles of *any* five sided polygon?

Angles in other shapes

What is the sum of the angles of *any* six sided polygon?

Comparing shapes

Congruent: two shapes are *congruent* if they are identical. Same shape and sizes!

- Angles are the same
- Distances/measurements are the same

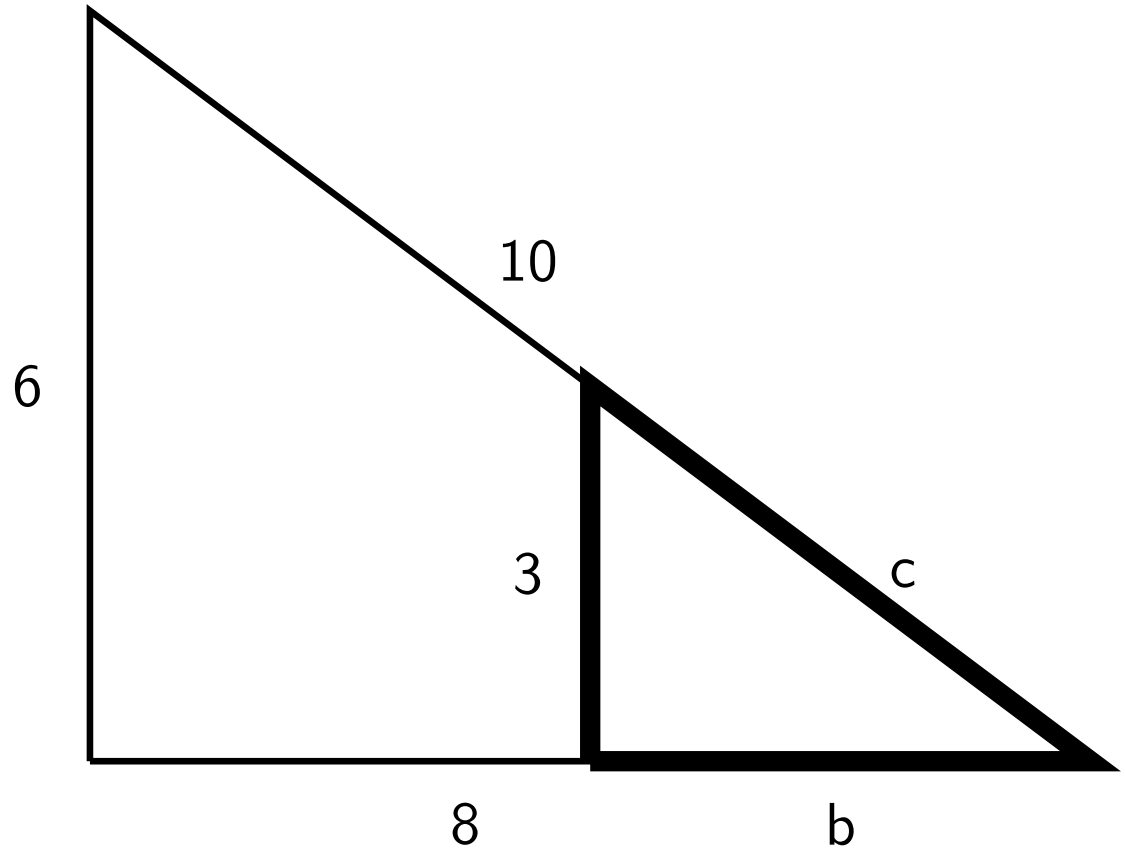
Similar: two shapes are *similar* if they have the same shape, but not necessarily the same size.

- Angles are the same
- Distances can vary by scaling (**ratios** between distances remain the same)

Example of similar shapes:

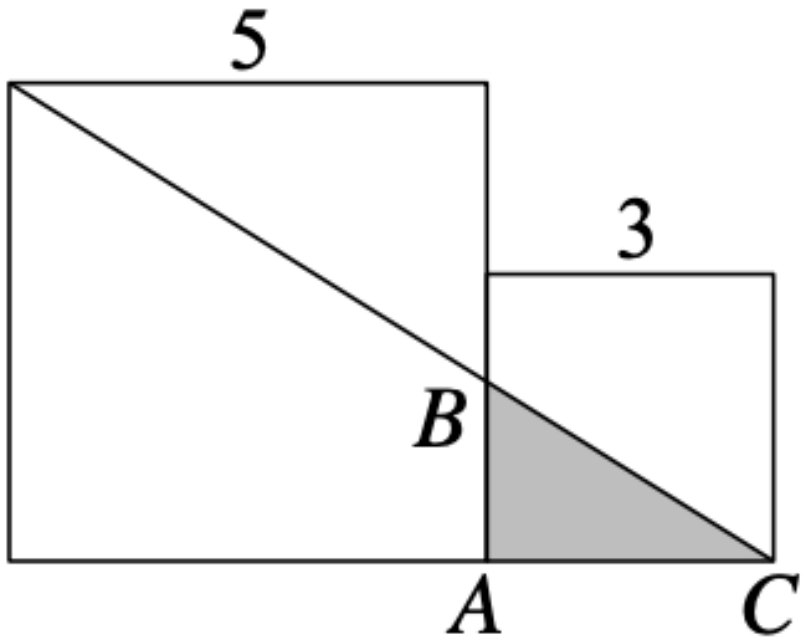
-
-

17. **Example.** Determine the missing side lengths a and c.



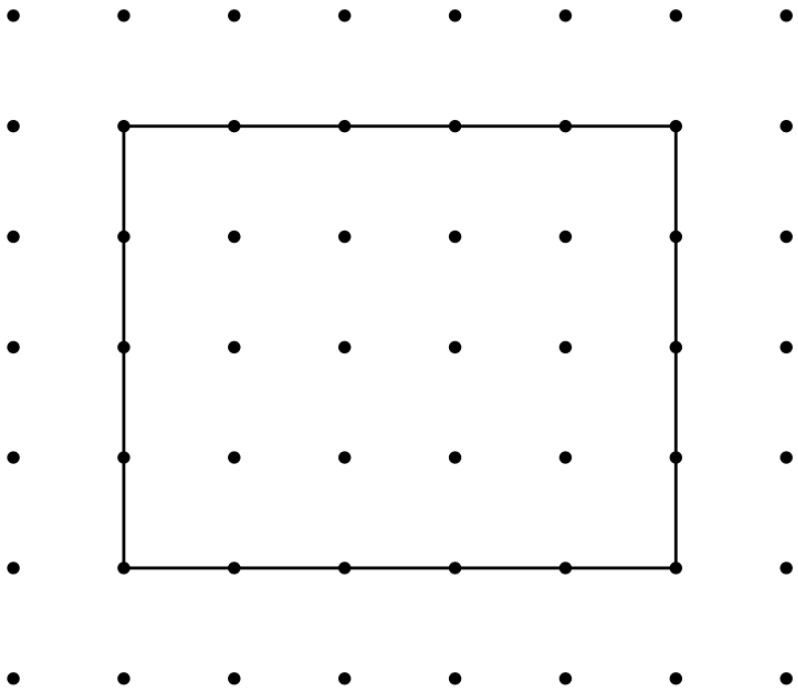
18. **Practice.**

In the picture below, the larger square has side 5, and the smaller square has side 3.
What is the length of AB ?
Express your answer as a common fraction.
(Hint: Some triangles are similar.)



Area

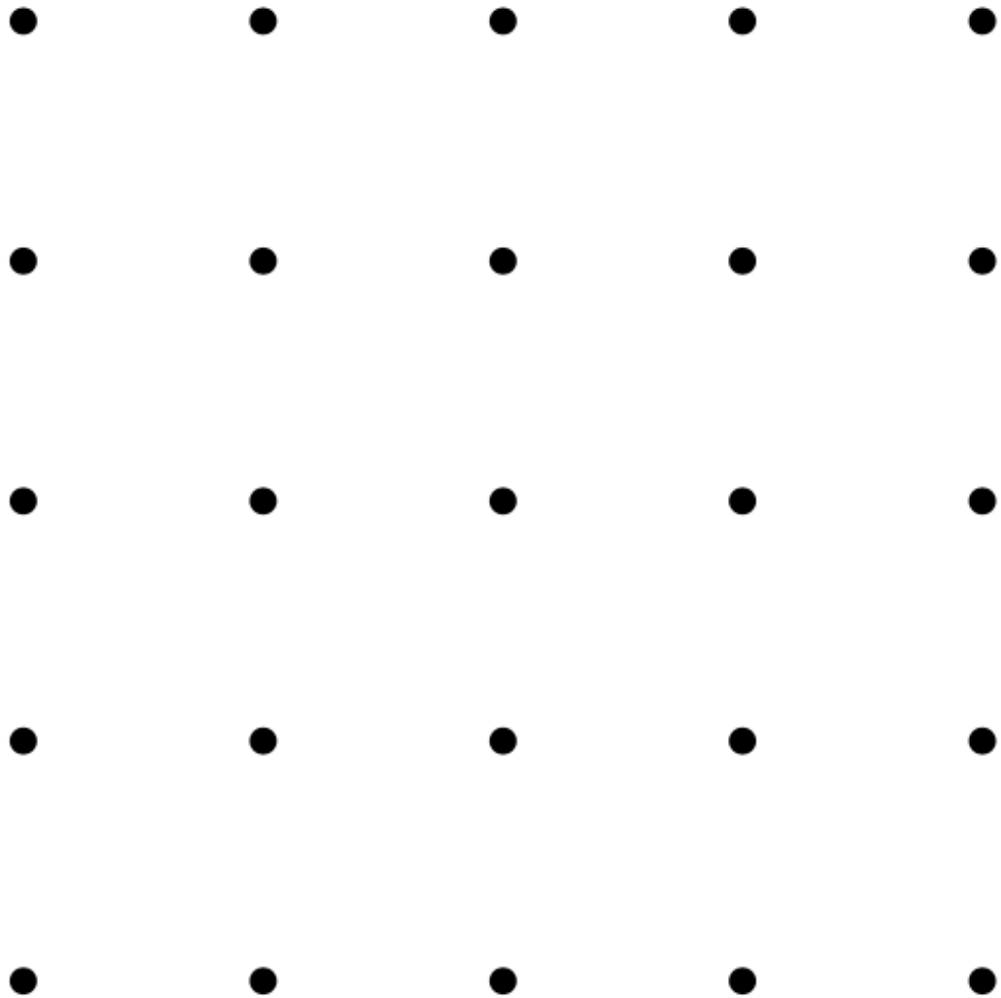
...Another way to answer "how big is this shape?"



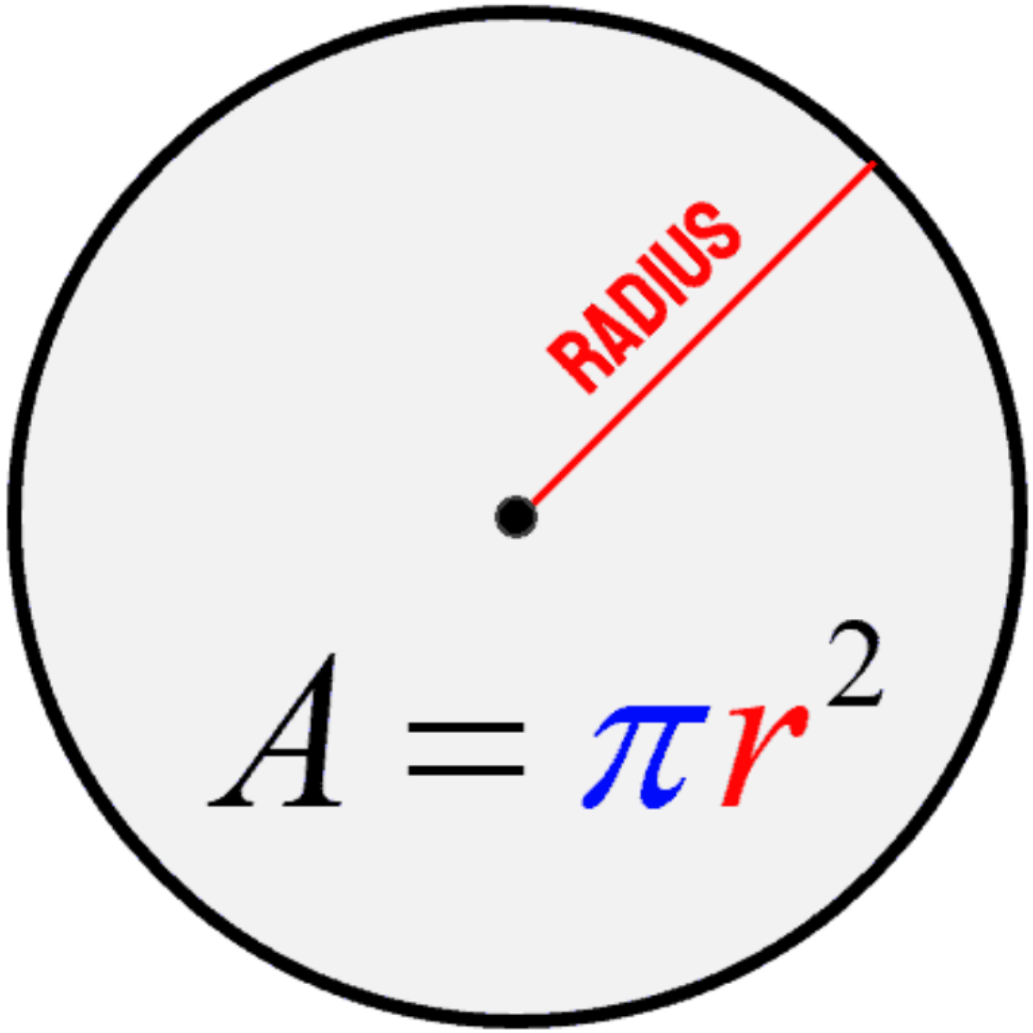
19. **Example.**

What is the area of a rectangle with sides 5 and 7?

Area: Triangles



Area: circles



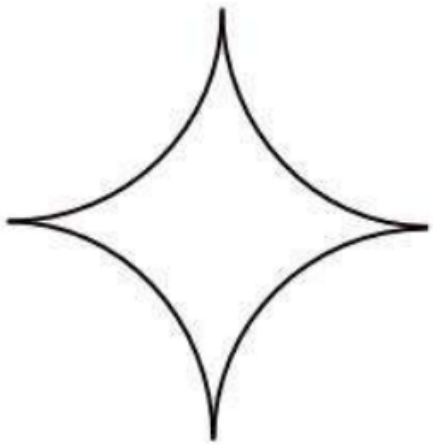
Practice

20. What is the circumference of a circle with area $\frac{144}{\pi}$?

Practice

21.

The figure below consists of 4 quarter circles of radius 2.
What area is enclosed in the figure rounded to the nearest whole number?



Practice

22.