Today's Materials

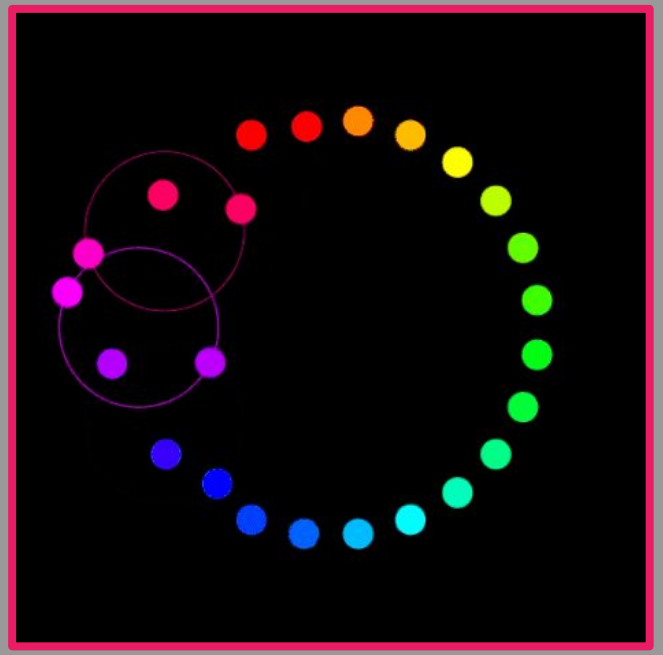
- calculator
- pencil
- notebook
- glue

Applying Area of Circles

Lesson 9

CCSS Standards: Addressing	• 7.G.B.4

Let's find the areas of shapes made up of circles!



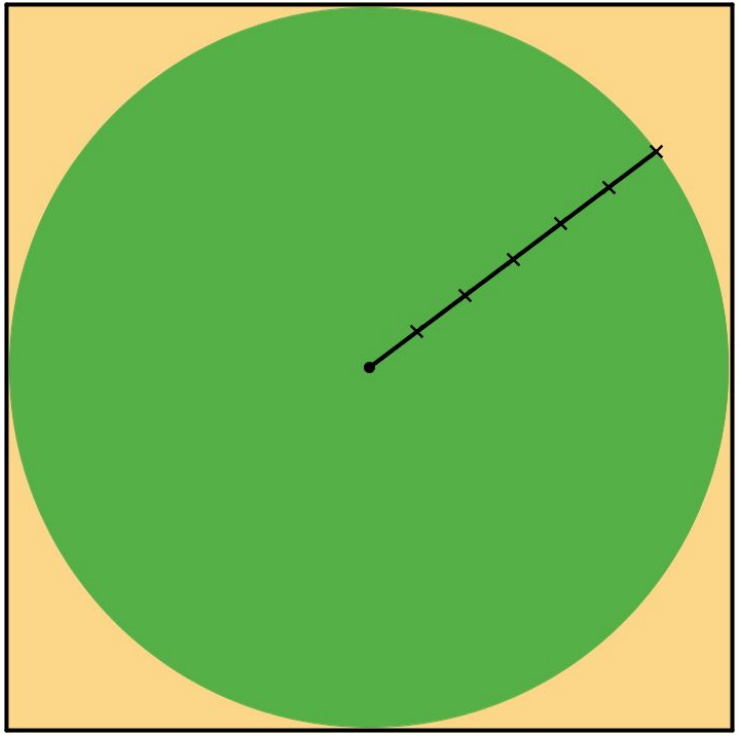
Today's Goals

- ❏ I can write exact answers in terms of π.
- ❏ I can calculate the area of more complicated shapes that include fractions of circles.

Still Irrigating the Field

Warm Up

The area of this field is about 500,000 m^2. Assume that the side-lengths of the square area exactly 800 m.



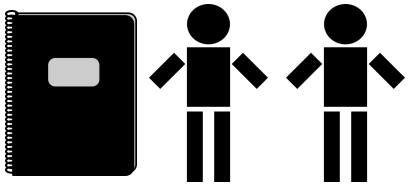
What is the field's <u>area</u> to the nearest square meter?

- $3.14 \cdot 400^2 = 502{,}400$
- $3.1415 \cdot 400^2 = 502{,}640$
- $3.1415927 \cdot 400^2 \approx 502{,}655$
- $3.1416 \cdot 400^2 = 502{,}656$
- $\frac{22}{7} \cdot 400^2 \approx 502{,}857$

Comparing Areas Made of Circles

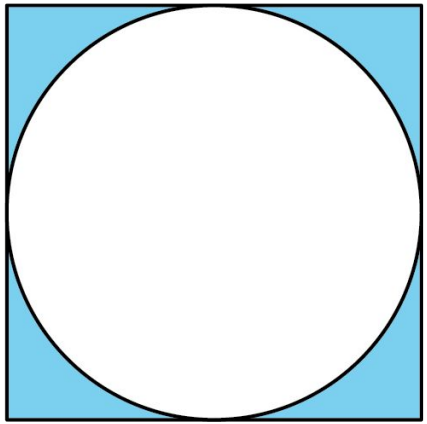
Activity 1

- 5 Practices

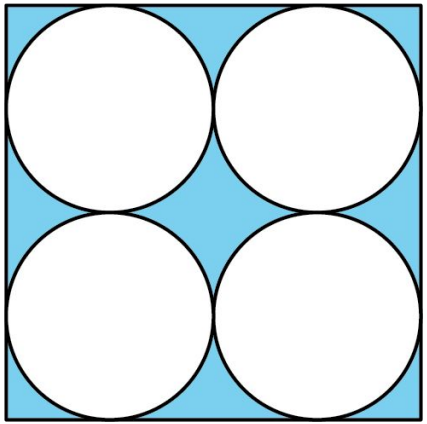


Before we calculate anything, make a prediction:
Which figure has the largest shaded (blue) region?

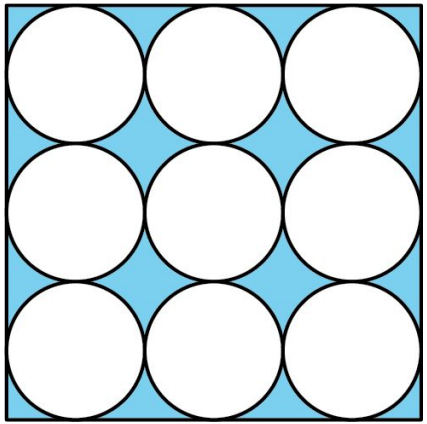
A



B



C



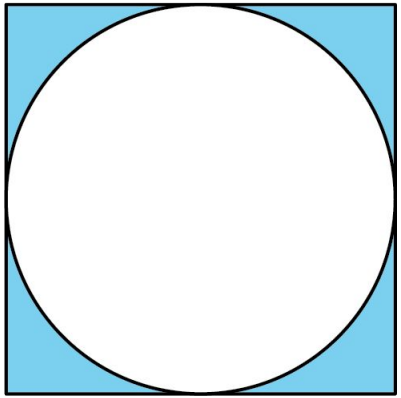
Work on this activity, beginning on your own. Then we'll discuss your thinking as a class.

#1 Each square has a side length of 12 units.

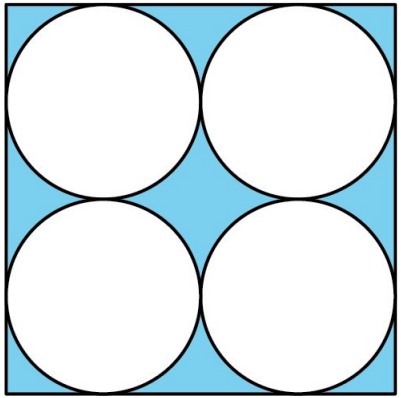
Compare the areas of the shaded regions in the 3 figures.

Which figure has the largest shaded region? Explain.

A



B



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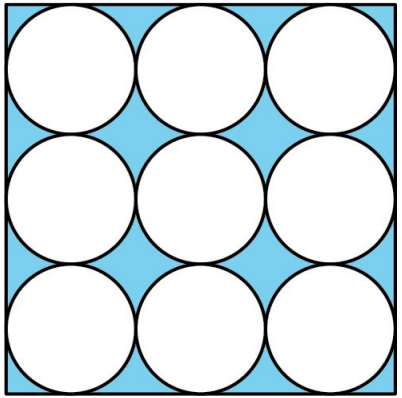
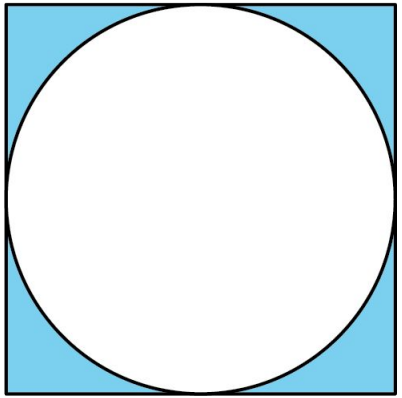
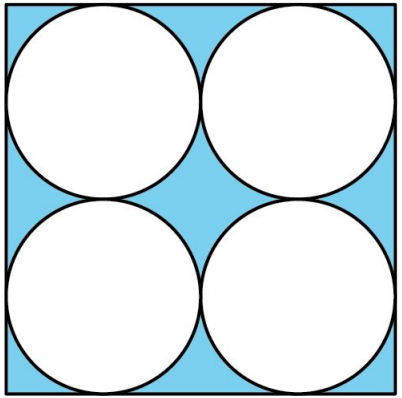


How could we write the areas of the circles in terms of π?

A



B



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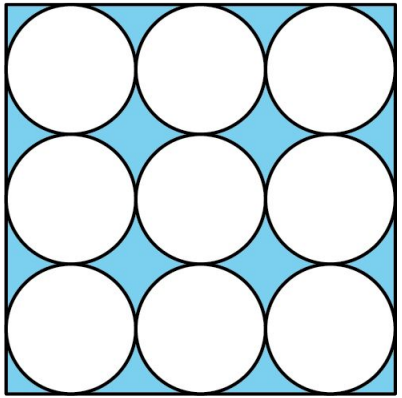
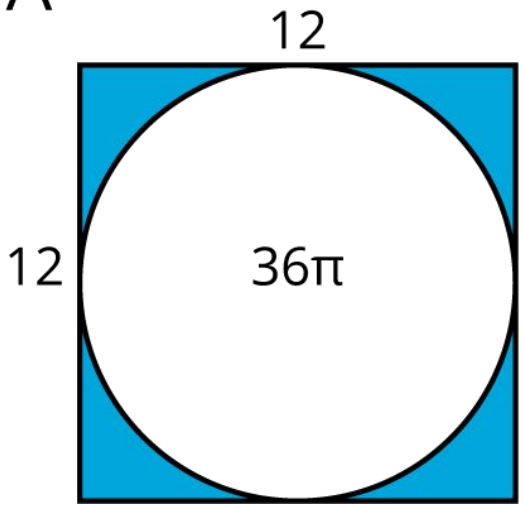
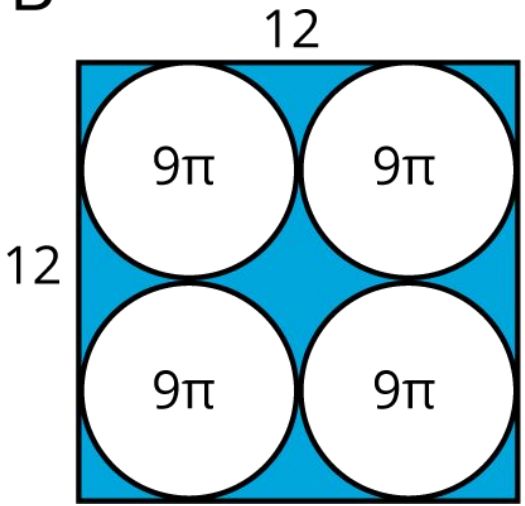


The area of the shaded region for each of these figures is **144 – 36π**.

A



B



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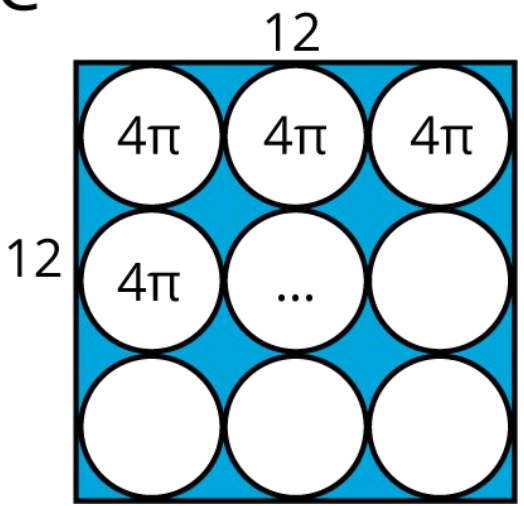
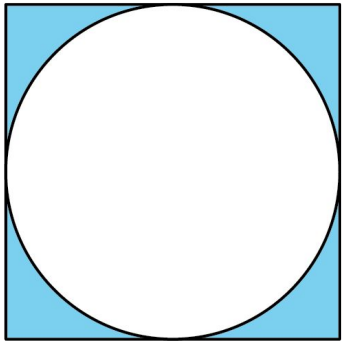


How were your strategies for each problem different?

A



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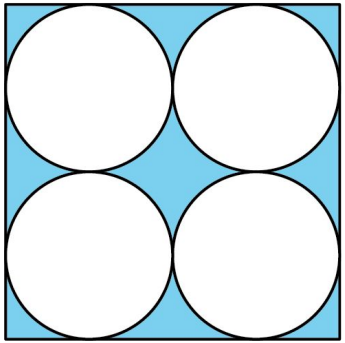

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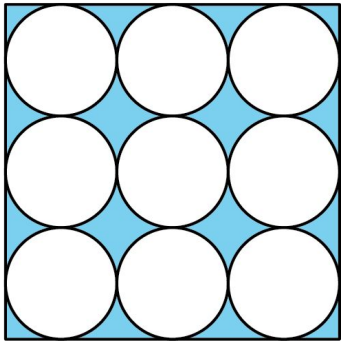
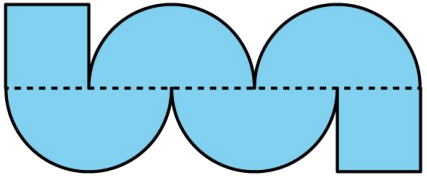
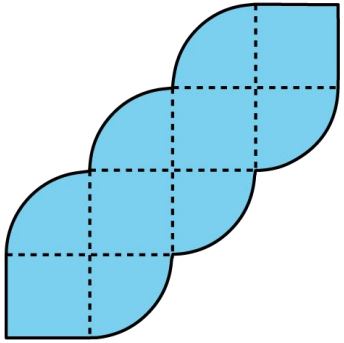


D



E

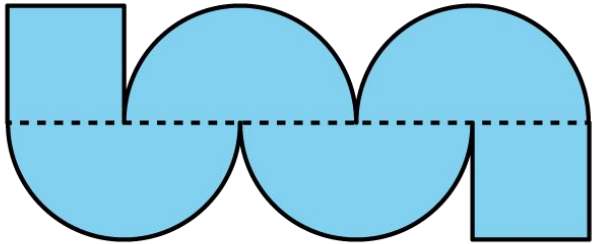


#2 Each square has a side length of 1 unit.

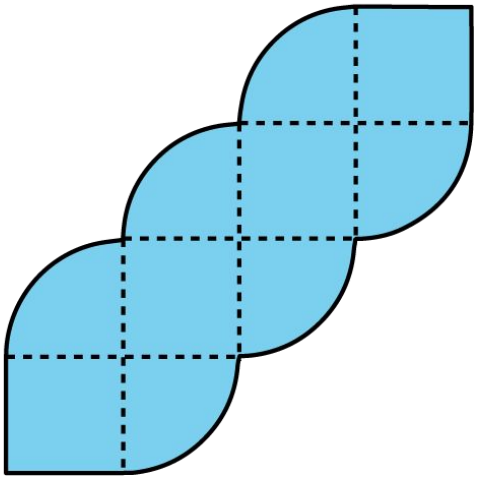
Compare the area of the two figures.

Which figure has more area? How much more?

D



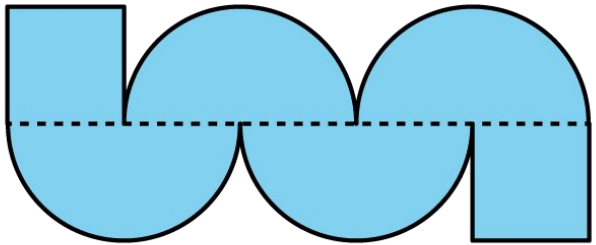
E



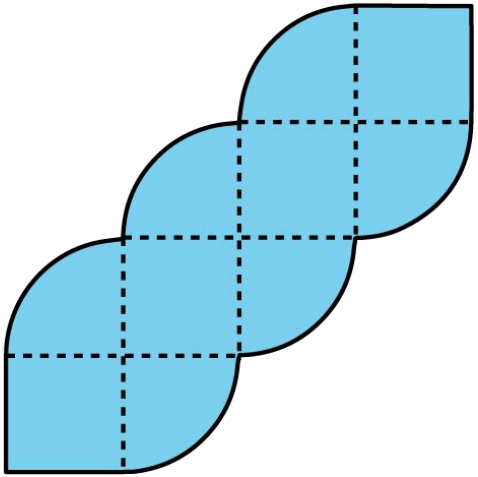
How could we find Figure E's area in terms of π?

Figure D's area when they're written in terms of π?

D



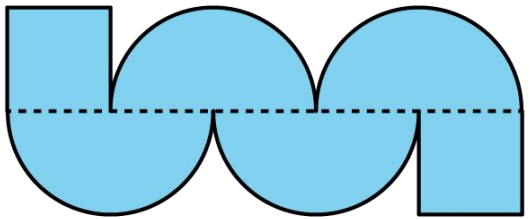
E



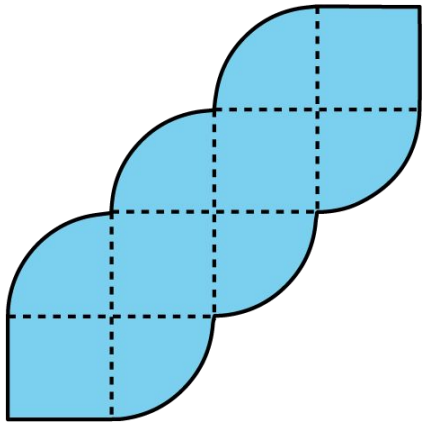
Are you ready for more?

Which figure has a longer perimeter, Figure D or Figure E? How much longer?

D



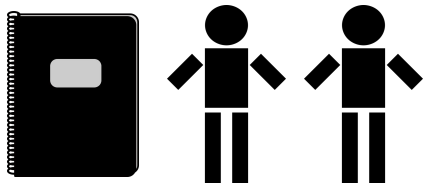
E



The Running Track Revisited

(optional)

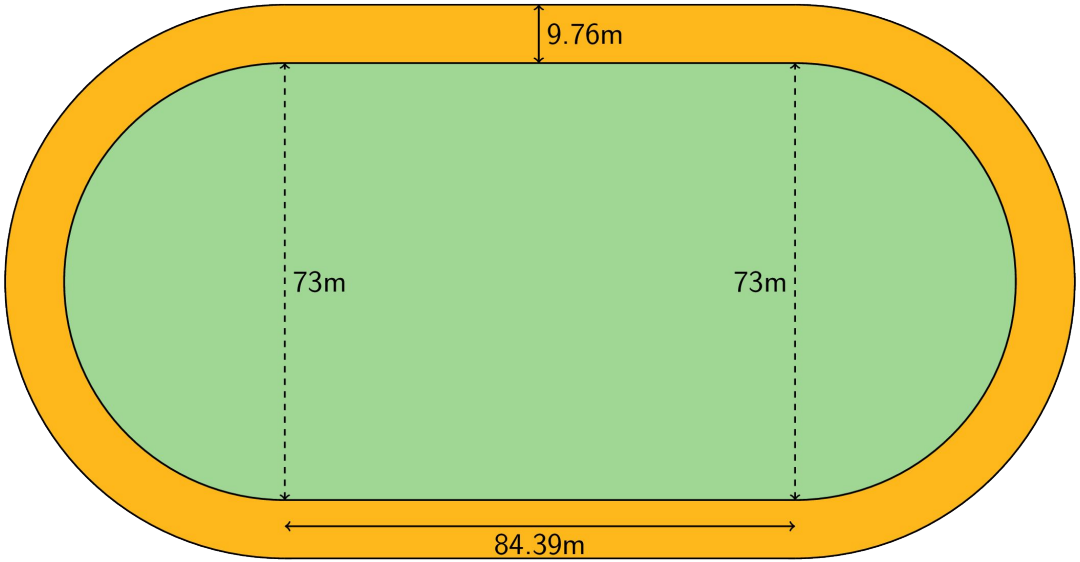
Activity 2



Work with your partner on this activity. (3-4 min.)

Share your thoughts as a team.
Work together until you reach an agreement.

What is the area of the running track that goes around the field? Explain or show your reasoning?



What is the area, in terms of π, of a circle with a **radius** of 10?

$= 100\pi$

because $A = \pi r^2$ and $10^2 = 100$

What is the area, in terms of π, of a circle with a **diameter** of 10?

$= 25\pi$

because $10 \div 2 = 5$ and $5^2 = 25$

What is the area, in terms of π, of a half-circle with a **diameter** of 10?

$= 12.5\pi$

because $25 \div 2 = 12.5$

Today's Goals

- ❏ I can write exact answers in terms of π.
- ❏ I can calculate the area of more complicated shapes that include fractions of circles.

Area of an Arch

Cool Down