Circles on the ISEE
Middle and Upper Level

LESSON GOAL: Identify the parts of and solve problems with circles on the ISEE.

ISEE Question: Justin needs to fence off a circular pond that has an area of 25π square feet. How many feet of fencing does he need?

    A) 10 feet
    B) 15 feet
    C) 10π feet
    D) 15π feet

Helpful Tip: Even though this question doesn't mention it, the most important element of any circle is its **radius**. In every circle problem you see on the ISEE, make sure you find the radius first!

There are only two math concepts you need to know for circles on the ISEE, and both involve the radius, *r*:

    area (the "ground inside" of a circle), which is found by the formula $A = \pi r^2$ or $A = r^2\pi$
    circumference (the length around a circle), which is found by $C = 2\pi r$ or $C = 2r\pi$

Notice that both formulas contain the same three elements (2, π and the radius), so they are often confused. To keep them straight, remember that the area is two-dimensional, so the radius has to be squared, while the circumference one-dimensional and based on the **diameter**, which is double the radius ($C = d\pi = 2r\pi$).

Solution: Translate the problem into mathematical terms. The "feet of fencing" the problem asks us to solve for here is just the **circumference** of the circle.

STEP 1: To find the circumference, we need to know the radius. And the radius we can find from the area:

    $A = r^2\pi$
    $r^2\pi = 25\pi$
    $\div\pi \div\pi$
    $r^2 = 25$
    $r = \sqrt{25}$
    $r = 5$ feet

STEP 2: Now, we can use the radius in the circumference formula: $C = 2r\pi = 2(5)\pi = 10\pi$ feet

Helpful Tip: On ISEE questions with circles, the answer choices are almost always given in terms of π, like in this problem. So don't waste your time multiplying by 3.14!

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