

EXAMPLE

Nolan's class has 6 more boys than girls. There are 28 students altogether. How many girls are in Nolan's class?

Use the strategy *guess, check, and revise*. Guess a number of girls that is less than half of 28.

First guess: 12 girls, $12 + 6 = 18$ boys, $12 + 18 = 30$ students **Too high** ✗

Second guess: 10 girls, $10 + 6 = 16$ boys, $10 + 16 = 26$ students **Too low** ✗

Third guess: 11 girls, $11 + 6 = 17$ boys, $11 + 17 = 28$ students **Correct** ✓

► There are 11 girls in Nolan's class.

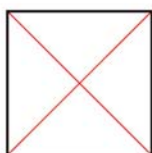
EXAMPLE

How many diagonals does a regular decagon have?

Use the strategy *solve a simpler problem*. A decagon has 10 sides, so find the number of diagonals of polygons with fewer sides and look for a pattern.



3 sides
0 diagonals



4 sides
2 diagonals



5 sides
5 diagonals



6 sides
9 diagonals



7 sides
14 diagonals

Notice that the difference of the numbers of diagonals for consecutive figures keeps increasing by 1:

$$2 - 0 = 2$$

$$5 - 2 = 3$$

$$9 - 5 = 4$$

$$14 - 9 = 5$$

So, an 8-sided polygon has $14 + 6 = 20$ diagonals, a 9-sided polygon has $20 + 7 = 27$ diagonals, and a 10-sided polygon has $27 + 8 = 35$ diagonals.

► A regular decagon (a 10-sided polygon) has 35 diagonals.

PRACTICE

- Ben has a concert at 7:30 P.M. First he must do 2 hours of homework. Then, dinner and a shower will take about 45 minutes. Ben wants to allow a half hour to get to the concert. What time should Ben start his homework?
- Quinn and Kyle collected 87 aluminum cans to recycle. Quinn collected twice as many cans as Kyle. How many cans did each person collect?
- In how many different ways can three sisters form a line at a ticket booth?
- The 8×8 grid at the right has some 1×1 squares, some 2×2 squares, some 3×3 squares, and so on. How many total squares does the grid have?
- If Kaleigh draws 20 different diameters in a circle, into how many parts will the circle be divided?
- Six friends form a tennis league. Each friend will play a match with every other friend. How many matches will be played?
- Susan has 13 coins in her pocket with a total value of \$1.05. She has only dimes and nickels. How many of each type of coin does Susan have?

