

Which is bigger, $n + 10$, or $2n + 3$?

How did you decide?

Here's how I decided:

"I wonder what happens when $n = 4$."

" $4+10=14$ but $2\times 4+3$ is only 11."

"So it looks like $n + 10$ is bigger."

But then my friend said:

"I wonder what happens when $n = 10$."

" $10+10=20$ but $2\times 10+3$ is 23."

"So it looks like $2n + 3$ is bigger."

**Can you explain why we have come to different conclusions?
Is there a diagram you could draw that would help?**

For the following pairs of expressions, can you work out when each expression is bigger?

$$2n + 7 \text{ and } 4n + 11$$

$$2(3n + 4) \text{ and } 3(2n + 4)$$

$$2(3n + 3) \text{ and } 3(2n + 2)$$

Here are some challenges to try:

- Find two expressions so that one is bigger whenever $n < 5$ and the other is bigger whenever $n > 5$
- Find three expressions so that the first is biggest whenever $n < 0$, the second is biggest whenever n is between 0 and 4, and the third is biggest whenever $n > 4$
- Find three expressions so that the first is biggest whenever $n < 3$, the second is biggest when $n > 3$, and the third is never the biggest.
- Find three expressions so that one of them is the biggest regardless of the value of n .