

irrational sequences: what comes next?

Look at these sequences, can you work out the term-to-term rule?
What will be the next number in the sequence?

a $\sqrt{2}, 2, 2\sqrt{2}, 4, \dots$

b $\sqrt{3}, 6, 12\sqrt{3}, 72, \dots$

c $\sqrt{2}, \sqrt{8}, \sqrt{18}, \sqrt{32}, \dots$

d $\sqrt{75}, \sqrt{48}, \sqrt{27}, \sqrt{12}, \dots$

e $9, 3\sqrt{3}, 3, \sqrt{3}, \dots$

f $2\sqrt{5}, -10, 10\sqrt{5}, -50, \dots$

g $\sqrt{3}-2, 3-2\sqrt{3}, 3\sqrt{3}-6, 9-6\sqrt{3}, \dots$

h $\sqrt{2}+1, 2\sqrt{2}+3, 5\sqrt{2}+7, 12\sqrt{2}+17, \dots$

extension:

Make up your own sequence. Can you partner figure out your term-to-term rule?

answers

a $\sqrt{2}, 2, 2\sqrt{2}, 4, 8$

b $\sqrt{3}, 6, 12\sqrt{3}, 72, 144\sqrt{3}$

c $\sqrt{2}, \sqrt{8}, \sqrt{18}, \sqrt{32}, \sqrt{50}$

d $\sqrt{75}, \sqrt{48}, \sqrt{27}, \sqrt{12}, \sqrt{3}$

e $9, 3\sqrt{3}, 3, \sqrt{3}, 1$

f $2\sqrt{5}, -10, 10\sqrt{5}, -50, 50\sqrt{5}$

g $\sqrt{3}-2, 3-2\sqrt{3}, 3\sqrt{3}-6, 9-6\sqrt{3}, 9\sqrt{3}-18$

h $\sqrt{2}+1, 2\sqrt{2}+3, 5\sqrt{2}+7, 12\sqrt{2}+17, 17\sqrt{2}+41$

forwards & backwards explained

This is an activity for two students.

Student A thinks of a sequence involving irrational numbers. They write the first term and the term to term rule in the first column. They then work out the first few terms of the sequence and write them in the second column.

They then cut the sheet down the line marked and give their paper to their partner, student B, who must work out what the term-to-term rule is and what the next term in the sequence will be.

The students can then check their partner's answers.

It works nicely as an extension activity as students should be motivated to make their sequences as difficult as possible!

forwards & backwards

Student A: Choose a first term and a rule.	Student A: Work out four terms of the sequence.	Student B: Work out the rule and the fifth term.
<i>eg.</i> $\sqrt{2}$, $\times \sqrt{3}$	$\sqrt{2}, \sqrt{6}, \sqrt{18}, \sqrt{54}, \dots$	$\times \sqrt{3}, \sqrt{162}$



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