Corbett maths

Examples

Workout

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Question 1: The first 4 numbers in the Fibonacci sequence are 1, 1, 2, 3, . . .

(a) What is the 5th term of the Fibonacci sequence?
(b) What is the 6th term of the Fibonacci sequence?
(c) Describe the rule for continuing the Fibonacci sequence.

Question 2: Find the next three terms of the following Fibonacci-style sequences

(a) 2, 4, 6, 10, . . .   (b) 3, 6, 9, 15, . . .   (c) 4, 8, 12, 20, . . .

(d) 15, 23, 38, 62, . . .   (e) 5, 12, 17, 29, . . .   (f) $-3, 5, 2, 7, \ldots$

(g) 35, 60, 95, 155, . . .   (h) $-1, -3, -4, -7, \ldots$ (i) 1.2, 2.7, 3.9, 6.6, . . .

(j) 0.11, 2.32, 2.43, 4.75, . . . (k) $-5.1, 1.1, -4, -2.9, \ldots$ (l) $-0.5, -0.7, -1.2, -1.9, \ldots$

(m) $\dfrac{1}{11}, \dfrac{3}{11}, \dfrac{4}{11}, \dfrac{7}{11}, \ldots$ (n) $\dfrac{5}{6}, \dfrac{11}{12}, \dfrac{7}{4}, \dfrac{8}{3}, \ldots$ (o) $-\dfrac{1}{5}, \dfrac{1}{2}, \dfrac{3}{10}, \dfrac{4}{5}, \ldots$

Question 3: Find the missing term in each of the Fibonacci-style sequences below.

(a) $\square$, 13, 20, 33, . . .   (b) 11, $\square$, 26, 41, . . .   (c) $\square$, 69, 109, 178, . . .

(d) $\square$, 3.7, 4.9, 8.6, . . . (e) 26.3, $\square$, 64.4, 102.5, . . . (f) 10.25, $\square$, 25.75, 41.25, . . .

(g) 6, $\square$, 4, 2, . . .   (h) $-12, \square, -4, 4, \ldots$ (i) $\square, -\dfrac{5}{4}, -2, -\dfrac{13}{4} \ldots$

Apply

Question 1: For each of the following Fibonacci-style sequences, find the next 4 terms.

(a) $a, 4a, 5a, 9a, \ldots$ (b) $3x, 3x + y, 6x + y, 9x + 2y, \ldots$

(c) $6a, -2a, 4a, 2a, \ldots$ (d) $2y, y + z, 3y + z, \ldots$

(e) $4x - 5y, 2x - y, 6x - 6y, \ldots$ (f) $-x, x + y, y, \ldots$

Question 2: Beth wants to generate a Fibonacci style sequence.
The first term is 3 and the second term is 4.
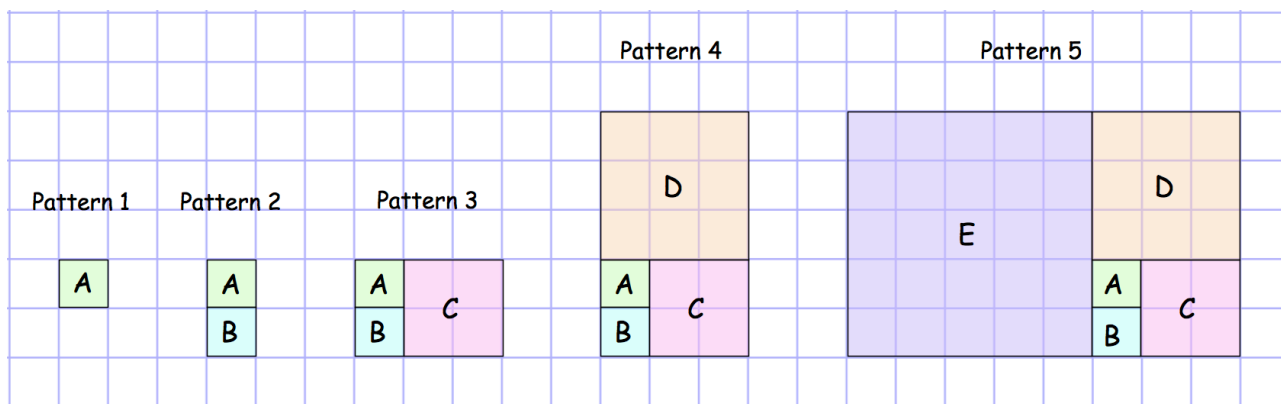
(a) Find the 3rd term.
(b) Find the 4th term.

Beth thinks that the sum of the first ten terms is equal to 11 times the 7th term
of her sequence.

(c) Show that Beth is correct.

Question 3: Using the first term of x and the second term of y, prove your answer to
Question 2 (c).

Question 4: Ethan generates the pattern below

(a) Draw Pattern 6
(b) What is the length of each side of square F?
(c) What is the length of each side of square G?
(d) What is the length of each side of square H?
(e) What do you notice about your answers to (b), (c) and (d)?

Question 5: Dylan is researching what happens when a term
in the Fibonacci sequence is divided by the term before it.

(a) Find the missing answers
(b) What do you notice?
(c) Research the Golden Number.

$1 \div 1 = 1$
$2 \div 1 = 2$
$3 \div 2 = 1.5$
$5 \div 3 = 1.666...$
$8 \div 5 =$
$13 \div 8 =$
$21 \div 13 =$

Answers

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Textbook 287a

Answers

1a)   5   b)   8   c)   "to get the next term, add the previous 2"

2a)   16, 26, 42   b)   24, 39, 63   c)   32, 52, 84

d)   99, 160, 259   e)   46, 75, 121   f)   9, 16, 25

g)   250, 405, 655   h)   -11, -18, -29   i)   10.5, 17.1, 27.6

j)   7.18, 11.93, 19.11   k)   -6.9, -9.8, -16.7   l)   -3.1, -5, -8.1

m) $1, 1\,{}^{7}/_{11}, 2\,{}^{7}/_{11}$ n) ${}^{53}/_{12}, {}^{85}/_{12}, {}^{23}/_{2}$ o) ${}^{11}/_{10}, {}^{19}/_{10}, 3$

3a)   7   b)   15   c)   40

d)   1.2   e)   38.1   f)   15.5

g)   -1.8   h)   7.6   i)   -0.75

Apply

1a)   14a, 23a, 37a, 60a   b)   15x + 3y, 24x + 5y, 39x + 8y, 63x + 13y

c)   6a, 8a, 14a, 22a   d)   4y + 2z, 7y + 3z, 11y + 5z, 18y + 8z

e)   8x – 7y, 14x – 13y, 22x – 20y, 36x – 33y f)   x + 2y, x + 3y, 2x + 5y, 3x + 8y

2a)   7   b)   11

c)   Sequence is 3, 4, 7, 11, 18, 29, 47, 76, 123, 199…

    Sum of these first ten terms is 517

    The seventh term is 47.

    47 x 11 = 517, showing that Beth is correct
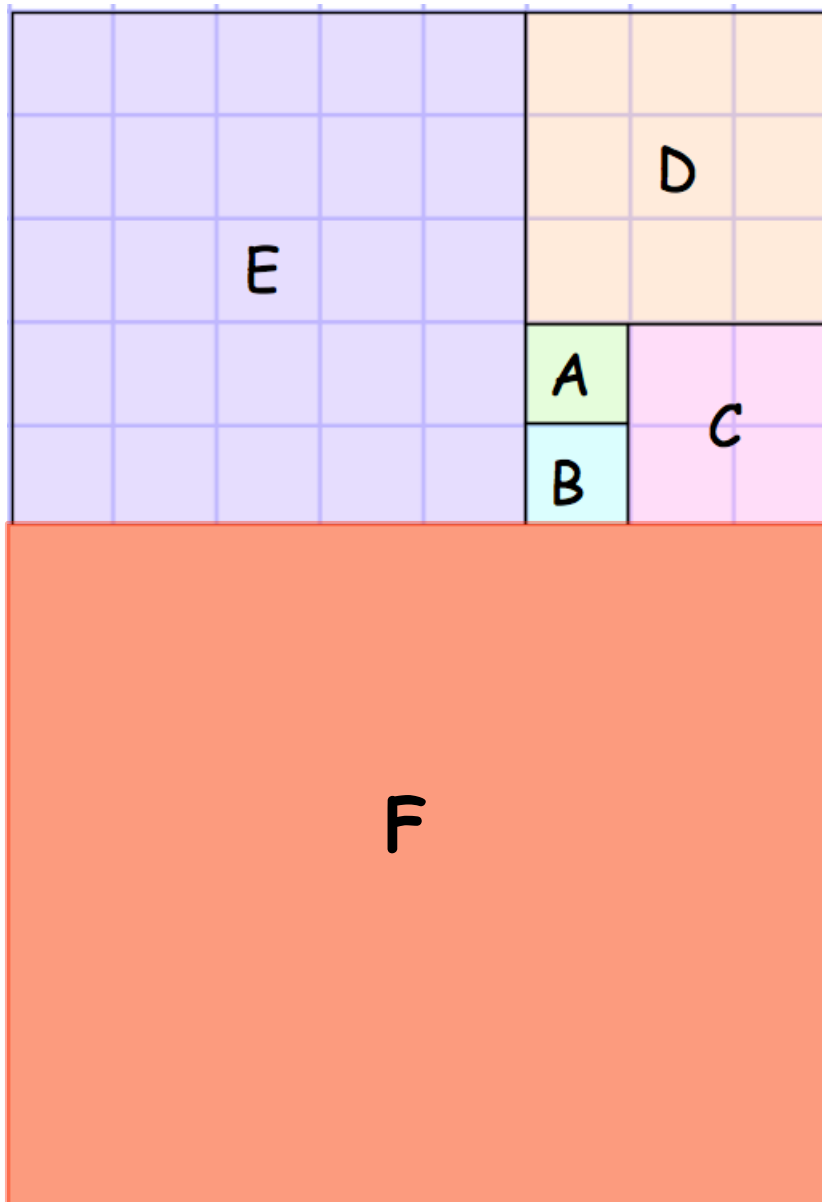
3)   1st Term: x

2nd Term: y

3rd Term: x + y

4th Term: x + y + y = x + 2y

The sequence continues: 2x + 3y, 3x + 5y, 5x + 8y, 8x + 13y, 13x + 21y, 21x + 34y

Sum of the first 10 terms = 55x + 88y

11 times the 7th term = 11(5x + 8y) = 55x + 88y

4)

b)   8

c)   13

d)   21

e)   They are all part of the Fibonacci sequence, starting 1, 1, 2, 3,…..

5a)   8 ÷ 5 = 1.6   13 ÷ 8 = 1.626   21 ÷ 13 =1.6153….

b)   Each term is around 1.6, and the sequence appears to be converging

The limit of this sequence is the "Golden Number" or "Golden Ratio", usually called φ ("phi")