Name



Functions - Recurrence Relations

1 What is g(-4)?

$$f(x) = 3x + 2, \quad g(x) = x^2$$

A 16	B 17
C 18	D 15

2 What is f(g(-4))?

$$f(x) = 4x + 3, \quad g(x) = x^2$$

A 66	B 67
C 68	D 69

3 Which expression is f(g(x))?

$$f(x) = 4x - 2, \quad g(x) = x^2$$

A	$16x^2 - 16x + 4$
B	$5x^2 - 2$
C	$4x^2 - 1$
D	$4x^2 - 2$

4 Which expression is g(f(x))?

$$f(x) = 3x + 4, \quad g(x) = x^2$$

A	$9x^2 + 24x + 16$
B	$9x^2 + 24x + 17$
C	$3x^2 + 4$
D	$9x^2 + 25x + 16$

5 Starting at 0, after 1 applications the value is -1. Iterate f once more: what is the next value?

$$f(x) = 2x - 1$$

A -2	B -1
C -4	D -3

6 Starting at -2, iterate f 4 times. What is the resulting value?

$$f(x) = 3x - 3$$

A -280	B -283
C -282	D -281

7 Assume f is linear. What is its slope?

x	1	2	3
$f(x)$	-2	0	2

A 4	B 3
C 2	D 1

8 Assume f is linear. What is f(5)?

x	1	2	3
$f(x)$	-1	-5	-9

A -15	B -18
C -17	D -16

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9 Which linear rule matches the table?

x	1	2	3
$f(x)$	1	2	3

A $f(x) = x + 1$

B $f(x) = x$

C $f(x) = 2x$

D $f(x) = 0$

10 Find the inverse function of b(x)

A $b^{-1}(x) = \frac{5}{4x}$

B $b^{-1}(x) = \frac{5x}{4}$

11 What is the result of n(p(x))?

given :

$n(x) = p^{-1}(x)$

what is $n(p(x))$

A x

B 1

C x^{-1}

D $\frac{1}{x}$

E x^2

12 Is y(x) the inverse of n(x)?

$y(n(x)) = 1$

A No

B Yes

13 Is p(x) the inverse of r(x)

A Yes

B No

14 What is $f(2)$?

$f(n) = 1f(n-1) + 2$

$f(1) = -2$

$n \geq 2$

A 0

B 1

C 2

D -1

15 What is $f(6)$?

$f(n) = 1f(n-1) - 4$

$f(1) = 1$

$n \geq 2$

A -17

B -18

C -20

D -19

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16 What is $f(2)$?

$$f(n) = 2f(n-1) + ($$
$$f(1) = 3$$
$$n \geq 2$$

A	7	B	8
C	5	D	6

17 What is $f(4)$?

$$f(n) = 3f(n-1) + ($$
$$f(1) = -1$$
$$n \geq 2$$

A	-25	B	-28
C	-26	D	-27

18 What is $f(2)$?

$$f(n) = 3f(n-1) + 3$$
$$f(1) = -2$$
$$n \geq 2$$

A	-1	B	-3
C	-2	D	-4

19 What is $f(4)$?

$$f(n) = 3f(n-1) + 1$$
$$f(1) = -3$$
$$n \geq 2$$

A	-66	B	-69
C	-68	D	-67

20 Find the inverse function of z(x)

A	B
$z^{-1}(x) = \frac{5^{\frac{x}{-4}}}{-2}$	$z^{-1}(x) = \frac{5^{\frac{x}{-2}}}{-4}$

21 Is y(x) the inverse of p(x)

A	B
Yes	No

22 What is $f(3)$?

$$f(n) = 1f(n-1) + 1f(n-2)$$
$$f(1) = 2$$
$$f(2) = 2$$
$$n \geq 3$$

A	4	B	6
C	5	D	3

23 What is $f(5)$?

$$f(n) = 1f(n-1) + 1f(n-2)$$
$$f(1) = -1$$
$$f(2) = 1$$
$$n \geq 3$$

A	1	B	3
C	2	D	0

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Functions - Recurrence Relations

24 What is $f(3)$?

$$f(n) = 3f(n-1) + 2f(n-2)$$
$$f(1) = -1$$
$$f(2) = 2$$
$$n \geq 3$$

A	6	B	4
C	5	D	3

25 What is $f(5)$?

$$f(n) = 3f(n-1) + 3f(n-2)$$
$$f(1) = -2$$
$$f(2) = -2$$
$$n \geq 3$$

A	-160	B	-163
C	-161	D	-162

26 Which recurrence rule matches the table?

A

$$f(1) = 7$$
$$f(n) = f(n-1) - 5$$
$$n \geq 2$$

B

$$f(1) = 7$$
$$f(n) = f(n-1) - 3$$
$$n \geq 2$$

C

$$f(1) = 7$$
$$f(n) = f(n-1) - 4$$
$$n \geq 2$$

D

$$f(1) = 7$$
$$f(n) = f(n-1) - 6$$
$$n \geq 2$$

27 Which table lists $f(1)$ through $f(4)$?

$$f(1) = -5$$
$$f(n) = f(n-1) + 1$$
$$n \geq 2$$

28 Which equation follows at -x?

$$2f(x) + f(-x) = 2x + 6$$

A	$2f(-x) + f(x) = -2x + 6$
B	$2f(-x) + f(x) = -2x + 5$
C	$2f(-x) + f(x) = -2x + 7$
D	$2f(-x) + f(x) = -x + 8$

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29 Which rule defines f(x)?

$$2f(x)+f(-x)=3x$$

A $f(x)=4x+2$

B $f(x)=3x$

C $f(x)=3x-1$

D $f(x)=3x+1$

30 For x != 0, which equation follows at 1/x?

$$2f(x)-3f(1/x)=3x^2+\frac{1}{x^2}$$

A $2f(1/x)-3f(x)=x^2+3\frac{1}{x^2}$

B $2f(1/x)-3f(x)=x^2+4\frac{1}{x^2}$

C $2f(1/x)-3f(x)=2x^2+5\frac{1}{x^2}$

D $2f(1/x)-3f(x)=x^2+2\frac{1}{x^2}$

31 For x != 0, which rule defines f(x)?

$$2f(x)-3f(1/x)=2x^2-3\frac{1}{x^2}$$

A $f(x)=\frac{6x^2+2\frac{1}{x^2}}{5}$

B $f(x)=\frac{5x^2+\frac{1}{x^2}}{5}$

C $f(x)=\frac{5x^2-\frac{1}{x^2}}{5}$

D $f(x)=\frac{5x^2}{5}$

32 Does this identity determine a unique function on all real x?

$$f(x)+f(x+1)=-6x-9$$

A Yes; the affine solution is the only possible solution.

B Yes; substituting x = 0 determines every value of f.

C No; no function can satisfy the identity.

D No; an alternating term t(x) with t(x+1) = -t(x) can be added to an affine solution.

33 What is f(0)?

$$f(x+y)=f(x)+f(y),\quad f(1)=3$$

A 1

B 2

C 0

D -1

34 What is f(3)?

$$f(x+y)=f(x)+f(y),\quad f(1)=3$$

A 10

B 11

C 9

D 8

35 What is f(-5)?

$$f(x+y)=f(x)+f(y),\quad f(5)=-5$$

A 6

B 5

C 7

D 4