Bellwork Alg 2B Wednesday, January 17, 2018

1. Find the sum of the first 30 terms of this series: $21, 17, 13, 9, \ldots$

2. Find the sum of the terms of this series: $19, 33, 47, 61, \ldots, 285$

4. Solve each equation.

a) $\sqrt{x+39} + 3 = x$

b) $\log_7 x - \log_7 (x-5) = 2$

5. An object hangs from a spring. The formula $l = 30 + 2w$ relates the length l, in centimeters, of the spring to the weight, w, in newtons, of the object. Which of the following describes the meaning of the 2 in this context?

A. The length, in cm, of the spring with no weight attached.
B. The weight, in newtons, of an object that will stretch the spring 30 cm
C. The increase in the weight, in newtons, of the object for each one-cm increase in the length of the spring.
D. The increase in the length, in cm, of the spring for each one-newton increase in the weight of the object.

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Answers

1. Find the sum of the first 30 terms of this series: 21, 17, 13, 9, ...

Arithmetic $d = -4$

Last term: $a_{30} = 21 + (30-1)(-4) = -95$

$S_{30} = \frac{30}{2}(21 + -95) = -1110$

2. Find the sum of the terms of this series: 19, 33, 47, 61, ..., 285

Arithmetic $d = 14$

# of terms → $a_n = 19 + 14(n-1)$

$285 = 19 + 14(n-1)$

$266 = 14(n-1)$

$19 = n-1$

$n = 20$ terms

$S_{20} = \frac{20}{2}(19 + 285)$

$S_{20} = 3040$

4. Solve each equation.

a) $\sqrt{x+39} + 3 = x$

$-3 \quad -3$

$(\sqrt{x+39})^2 = (x-3)^2$

$x + 39 = x^2 - 6x + 9$

$0 = x^2 - 7x - 30$

$0 = (x-10)(x+3)$

$x = -3, 10$

$x = 10$

b) $\log_7 x - \log_7(x-5) = 2$

$\log_7\left(\frac{x}{x-5}\right) = 2$

$7^2 = \frac{x}{x-5}$

$49 = \frac{x}{x-5}$

$49(x-5) = x$

$49x - 245 = x$

$48x = 245$

$x = \frac{245}{48}$

5. An object hangs from a spring. The formula $l = 30 + 2w$ relates the length l, in centimeters, of the spring to the weight, w, in newtons, of the object. Which of the following describes the meaning of the 2 in this context?

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$y = mx + b$

↑ rate of change ↑ initial amount

$l = 30 + 2w$

↑ rate of change: how fast the length is increasing when weight is added

2 cm/newton