Let's get crazy key

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Algebra 2 Trig H **Name:**
Let's get crazy!

Calculate the following:

1. $\sum_{k=1}^{52} 47-3k$

Arithmetic Finites series

$S_n = \frac{n}{2}(a_1 + a_n)$

$S_{52} = \frac{52}{2}(44 + -109)$

$= 26 \cdot (-65)$

$= -1,690$

2. $\sum_{k=1}^{13} (-2)^k$

Geometric Finite series

$S_n = \frac{a_1(1-r^n)}{1-r}$

$= \frac{-2(1-(-2)^{13})}{1-2} = -5,462$

3. $\sum_{k=1}^{\infty} \left(\frac{4}{5}\right)^k$

Geometric infinite series

$S_\infty = \frac{4/5}{1-4/5} = \frac{\frac{4}{5}}{\frac{1}{5}} = \frac{4}{5} \cdot \frac{5}{1} = 4$

4. $\sum_{k=1}^{\infty} 6(-3)^{-k} = \sum^{\infty} 6\left(\frac{-1}{3}\right)^k$

Geometric infinite

$S_\infty = \frac{-2}{1+\frac{-1}{3}} = \frac{-2}{4/3} = -2 \cdot \frac{3}{4} = \frac{-3}{2}$

5. The sum of all multiples of 3 between 11 and 51, inclusive.

1,606.5

441

409.5

6. $\sum_{k=6}^{50} -7+4(k-1)$

$13 + 17 + 21 + \ldots + 189$

$a_n = 13 + 4(n-1)$

$189 = 13 + 4(n-1)$

$176 = 4(n-1)$

$44 = n-1$

$45 = n$

$\sum_{1}^{45} 13 + 4(n-1) = \frac{45}{2}(13+189)$

$= 4,545$

7. $\sum_{k=1}^{41}(-1)^{2k+1}\left(\frac{3}{4}\right)^k$

$= -1 \cdot \sum_{1}^{41}\left(\frac{3}{4}\right)^k$

$= -1 \cdot \frac{3/4\left(1-(3/4)^{41}\right)}{1-3/4}$

$= -2.999$

8. $\sum_{k=1}^{40}(-1)^{k+1}(8-3k)$

5, −2, −1, 4, . . .

$\sum_{1}^{20} 5+-6(n-1) + \sum_{1}^{20} -2+6(n-1)$

(odds) (evens)

$\frac{20}{2}(5+-109) + \frac{20}{2}(-2+112)$

$= 10 \cdot -104 + 10 \cdot 110 = 10(-104+110)$

$= 10(6)$

$= 60$

RECURSION!

The following sequences are more easily described using a recursive formula instead of a general form.

- Find the next 3 terms in the sequence
- Can you write a_n in terms of *n*, a_{n-1} *and/or* a_{n-2} ?

9. 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377,…

10. 5, 7, 11, 13, 17, …

11. 1, 4, 8, 13, 19, 26,...

12. THE SUPER CHALLENGE. Just write the next three terms: 1, 2, 2, 4, 8, 11, 33, 37, 148, ...