MUSTANG RACE

Non-Calculator

1. Find the sum of the first 120 positive even integers.

1. _____

2. Find the 9th term in a geometric sequence if $a_4 = 108$ and $a_6 = 972$.

2. _____

3. Find the sum of the infinite geometric series: $30 + 6 + 6/5 + 6/25 + \ldots$

3. _____

4. Find the nth term of the geometric sequence if $a_2 = 4$ and $a_6 = \dfrac{1}{64}$.

4. _____

5. Find a_n for the arithmetic sequence with $a_1 = 8$ and $d = -3$.

5. _____

6. Find the 4th term of $(x+2)^6$.

6. _____

7. Find $\dfrac{(x+3)!}{(x-2)!}$. Leave in factored form.

7. _____

Calculator

8. Find the partial sum of $\displaystyle\sum_{n=0}^{37} \dfrac{15 - \dfrac{n}{2}}{5}$.

8. _____

9. What is the 8th term in the expansion of $(2x - 5)^{11}$.

9. _____

10. Find the formula for a_n for the arithmetic sequence if $a_3 = 52$ and $a_{10} = 136$.

10. _____

11. Evaluate the summation: $\displaystyle\sum_{n=0}^{\infty} 2(0.015)^n$

11. _____

12. Find the coefficient of the $x^2 y^3$ term in the expansion of $(3x - y)^5$.

12. _____

13. Evaluate the summation: $\displaystyle\sum_{n=0}^{7} 3(\dfrac{5}{7})^n$

13. _____

Answers

1. 14,520
2. $\pm$26,244
3. 75/2 or 37.5
4. $a_n = \pm16(\pm0.25)^{n-1}$
5. $a_n = 11 - 3n$
6. $160x^3$
7. $x(x + 3)(x + 2)(x + 1)(x - 1)$
8. 437/10 or 43.7
9. $-412,500,000x^4$
10. $a_n = 12n + 16$
11. 400/197 or $\approx$2.030
12. -90
13. $\approx$9.789 (hint: $k = 1$ to $n = 8$)