Calculators OK!! Please round all answers to 3 decimal places where appropriate. 3 points each problem (except for the induction proof, naturally)

1a) Consider an arithmetic sequence that begins with 3, and whose 30th term is 500. Write in the 500-3= 497 second and third term.

3, 20.138, 37.276

16 497 - 29 = 17.137931

b) Find the first term of a geometric sequence whose 2nd term is 5 and whose 50th term is 500.

4.543/

500 = r 50 m 5= r 3 m

c) Consider an infinite geometric sequence that starts with 8, and whose sum is 50. Write in the second and third term. 50= 8

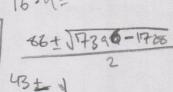
8, 6.72, 5.645

d) The sum of the first n terms of an arithmetic series is 1550. The middle number is 10. How many terms are in the sequence?

3100 = 10x

e) Three numbers have a geometric mean of 12 and an arithmetic mean of 30. One of them is 4. Find either of the other numbers.

4+b+c=90 3450 = 12



2. Solve for n:
$$\frac{(n-1)!(n+1)!}{n!(n-2)!} = 17$$

$$(n+1)(n-1) = 17$$

$$17 = 17$$

$$17 = 18$$

$$17 = 3\sqrt{2}$$

3. Use mathematical induction to prove that the product of consecutive integers is even. In other words, that (n)(n+1) is a multiple of 2. Please clearly show all of the important steps of your proof and use words/math to justify any conclusion. [7]

SHOW
$$n=1$$
 $(n)(n+1) = 2m$ $n = 2m$ $(n)(n+1) = 2m$ $n = 1$ $(2) = 2m$ (2)

1-0