Math 222-06 QUIZ 9: Solutions & Points 2008/10/24

- Total points: 10+10 quiz points.
- Show *complete work*—that is, all the steps needed to completely justify your answer.
- *Simplify* your answers as much as possible.
- If you need extra space, work on the back and make a note on the front.

Questions.

(a) Does this series converge, and if it does, can you find the sum?

$$3 - 4 + \frac{16}{3} - \frac{64}{9} + \cdots$$

(b) Write a formula for the nth term (a_n) of this series.

[Note: This is one of the assigned homework problems: Section 12.2, # 13.]

Solutions.

(a) Points: 5 for ratio, 5 for divergence.
[3 points for ratio 4/3.]

(a1) $a_1/a_0 = -4/3$
$a_2/a_1 = \frac{16/3}{-4} = -4/3$
$a_3/a_2 = \frac{-64/9}{16/3} = -4/3$
Conclusion: Geometric series with ratio $r = -4/3$.

(a2) Since $|r| > 1$, the series diverges.

(a) Alternate answer: Terms are increasing in absolute value, so the series diverges.
[7 points]

(a) Third answer: The series diverges.
[3 points]

(b) Since it's a geometric series, $a_n = a_0 r^n = 3(-4/3)^n$.
[8 points if almost correct.]

(b) Alternate answer: Partial sum s_n with correct term formula embedded.
[5 points]

(b) Alternate answer: Any attempt to find the term a_n instead of the partial sum s_n.
[2 points]