Dr Halbeisen*

Modules 110PMA003 & 110PMA107

Department of Pure Mathematics

Week 5, 2001

The pdf-file you may download from
`http://www.math.berkeley.edu/~halbeis/4students/zero.html`

Please hand in your solutions (stapled together with your full name on the first page) at the lecture on Thursday, 1 November 2001.

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18. Simplify as far as possible:
    (a) $\frac{1}{7}+\frac{2}{3}+\frac{1}{21}$ (b) $\frac{2}{1-\frac{3}{4}}$ (c) $\left(\frac{2}{9}\cdot\frac{3}{4}\right)+\frac{1}{2}$ (d) $\frac{\left(\frac{4\pi}{3}\right)}{2}+\frac{\pi}{3}$ (e) $\frac{6}{7-4}$

19. (a) Compute $(99+102+105+\ldots+999)$.
    (b) Compute (using part (a) or otherwise) $(33+34+35+\ldots+333)$.
    (c) Compute (using part (b) or otherwise) $(66+68+70+\ldots+666)$.

20. Let $a_0, a_1, a_2, \ldots$ be an arithmetic progression where $a_4 = 10$ and $a_{36} = 2$.
    (a) Compute the common difference d of this arithmetic progression.
    (b) Compute the initial term a_0.
    (c) Compute $(a_0 + a_1 + \ldots + a_{48})$.

21. (a) Compute $(3+6+12+24+\ldots+1536)$.
    (b) Compute the infinite series $\left(1-\frac{1}{5}+\frac{1}{25}-\frac{1}{125}\pm\ldots\right)$.

22. Let $a_0, a_1, a_2, \ldots$ be a geometric progression where $a_2 = 49$ and $a_6 = \frac{1}{49}$.
    (a) Compute the common ratio r of this geometric progression.
    (b) Compute the initial term a_0.

23. Let $2, 2r, 2r^2, \ldots$ be a geometric progression with initial term 2 and infinite series $(2+2r+2r^2+\ldots) = 8$. What is the common ratio r of this geometric progression?

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Office hours (Room 1007): Monday 1 pm–2 pm, Wednesday 2 pm–3 pm