Dr Halbeisen

Modules 110PMA003 & 110PMA107

Department of Pure Mathematics

Week 1, 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, 4th of October 2001.

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1. Expand the following:
   (a) $(a-b)(a+b)(a^2+b^2)$
   (b) $x2xy\big(x^2(y3-z)-2x(-y+z)\big)$
   (c) $b^2a\big(d(-a^3+3b)+a(4b^2-ada)+b(4ab-3d)\big)$

2. Rearrange the following to express w in terms of x and y:
   (a) $xw^2+2=8y$
   (b) $x(2-w)=6w+y$
   (c) $\frac{y}{w}=\frac{w}{x^3y}$
   (d) $\sqrt{y^3}=\sqrt[3]{\frac{xw}{x+w}}+1$

3. Which of the following two expressions is bigger and why?
   (a) $\sqrt{2}^{\left(\sqrt{2}^{\sqrt{2}}\right)}$, $\left(\sqrt{2}^{\sqrt{2}}\right)^{\sqrt{2}}$
   (b) $10^{(10^{10})}$, $\left(10^{10}\right)^{10}$
   (c) For which x we have $x^{(x^x)}=\left(x^x\right)^x$

4. Rearrange the following to express x in terms of a:
   (a) $\sqrt[7]{a}\,(\sqrt{a})^3=\sqrt[28]{x^3}$
   (b) $x^{\frac{3}{7}}\sqrt[7]{\frac{a}{x^2}}=\sqrt[7]{7a^2}$