(b) $z_1^3 - 3z_1^2 + 4z_1 - 8 =$

$= (2+i)^3 - 3(2+i)^2 + 4(2+i) - 8 =$

$= 2^3 + 3 \cdot 2^2 \cdot i + 3 \cdot 2 (i)^2 + i^3 - 3 (4 + 4i + i^2) .$

$+ 8 + 4i - 8 = 8 + 12i - 6 - i - 12 - 12i$

$+ 3 + 8 + 4i - 8 = -7 + 3i$

(c) $(\overline{z_3})^4 = \left(\overline{-\frac{1}{2} + \sqrt{\frac{3}{2}}\, i}\right)^4 = \left(-\frac{1}{2} - \sqrt{\frac{3}{2}}\, i\right)^4 =$

$= \left[\left(-\frac{1}{2} - \sqrt{\frac{3}{2}}\, i\right)^2\right]^2 = \left[\frac{1}{4} + \sqrt{\frac{3}{2}}\, i + \frac{3}{4} i^2\right]^2 =$

$= \left(-\frac{1}{2} + \sqrt{\frac{3}{2}}\, i\right)^2 = \frac{1}{4} - \sqrt{\frac{3}{2}}\, i + \frac{3}{4} i^2 = -\frac{1}{2} - \sqrt{\frac{3}{2}}\, i .$

(d) $\left| \frac{2z_2 + z_1 - 5 - i}{2z_1 - z_2 + 3 - i} \right|^2 = \left| \frac{2(3-2i) + (2+i) - 5 - i}{2(2+i) - (3-2i) + 3 - i} \right|^2 =$

$= \left| \frac{3 - 4i}{4 + 3i} \right|^2 = \frac{|3 - 4i|^2}{|4 + 3i|^2} = \frac{\sqrt{\left((3)^2 + (-4)^2\right)^2}}{\sqrt{\left((4)^2 + (3)^2\right)^2}} = 1$