In an effort to get these out quickly, to help people study for the final, I may have inadvertantly included some typos or other minor mistakes. Please let me know if you spot anything and I'll fix it up.

(1) Multiple Choice

(i) (b). Using the Law of Cosines,

$$\begin{aligned} c^2 &= 9 + 16 + (2)(3)(4)\cos 60^\circ \\ &= 25 - 12 = 13 \\ c &= \sqrt{13} \end{aligned}$$

(ii) (d). You could use Heron's Formula, but that's actually kind of messy in this case. You could also use the theorem that says the area is "1/2 times the lengths of two adjacent sides, times the sin of their included angle." In this case that's $\frac{1}{2}(3)(4)\frac{\sqrt{3}}{2} = 3\sqrt{3}$.

(iii) (c).

(iii) (d). Using De Moivre's Theorem,

$$z^4 = 3^4 \text{ cis } (4 \cdot 45^\circ) = 81 \text{ cis } 180^\circ = -81.$$

(2) You can solve for $\beta = 180^\circ - 24.6907^\circ = 153.3093^\circ$. Then you can solve for $\gamma = 180^\circ - 22^\circ - 153.3093^\circ = 2.6907^\circ$. Now use the Law of Sines to find b:

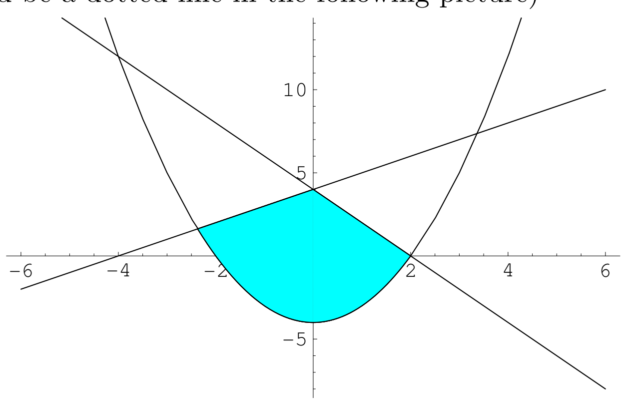
$$b = \frac{1.5}{\sin 2.6907^\circ} \cdot \sin 155.3093^\circ = 13.3473$$

In the large right triangle, $\sin 22^\circ = h/b$, so $h = 13.3473 \sin 22^\circ = 5$ km. (Other methods are possible.)

(3) Using our formula, $z_k = \sqrt[3]{8} \text{ cis } \left(\frac{60^\circ}{3} + \frac{360^\circ}{3}k\right)$ for $k = 0, 1, 2$.

$$\begin{aligned} z_0 &= 2 \text{ cis } (20^\circ) \\ z_1 &= 2 \text{ cis } (20^\circ + 120^\circ) = 2 \text{ cis } (140^\circ) \\ z_2 &= 2 \text{ cis } (20^\circ + 240^\circ) = 2 \text{ cis } (260^\circ) \end{aligned}$$

(4) (The parabola should be a dotted line in the following picture)



(5) These are nearly identical to examples 6 and 3 in §6.8 of your textbook.

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