

1. (a) i
 (b) $-\frac{3}{5} - \frac{4}{5}i$
 (c) $-11 - 2i$
 (d) $-8 + 8i\sqrt{3}$
 (e) $e^3 \cos 2 + ie^3 \sin 2$

2.

	$\operatorname{Re} z$	$\operatorname{Im} z$	\bar{z}	$z\bar{z}$	$ z $	$\operatorname{Arg} z$
(a)	3	-4	$3 + 4i$	25	5	$-\arctan \frac{4}{3}$
(b)	$\frac{1}{2}$	$-\frac{1}{2}$	$\frac{1}{2} + \frac{1}{2}i$	$\frac{1}{2}$	$\frac{1}{2}\sqrt{2}$	$-\frac{\pi}{4}$
(c)	-2	14	$-2 - 14i$	200	$10\sqrt{2}$	$\pi - \arctan 7$
(d)	$-\frac{1}{4}$	$-\frac{1}{4}$	$-\frac{1}{4} + \frac{1}{4}i$	$\frac{1}{8}$	$\frac{1}{4}\sqrt{2}$	$-\frac{3}{4}\pi$
(e)	-64	0	-64	4096	64	π
(f)	0	-1	i	1	1	$-\frac{1}{2}\pi$

3. 2.

4. (a) $2^{\frac{n+2}{2}} \cdot \cos(\frac{n\pi}{4})$.
 (b) $\frac{3}{2} - \frac{1}{2}i$.

5. (a) the open half-plane $y > x + 1$
 (b) the closed square with corners $1, i, -1$ and $-i$
 (c) the open half-plane $x > 0$
 (d) the closed sector $-x \leq y \leq x$ on or outside of the circle $x^2 + y^2 = 1$.

6. the closed half-plane $y \leq x$

7. $7 - 2\pi$.

8. $-5 + i\sqrt{5}, -5 - i\sqrt{5}$

9. (a) $\frac{4\pi}{3} + 2k\pi$ ($k \in \mathbb{Z}$).
 (b) doesn't exist.

10. $\frac{1}{2} \ln 2 + i \left(\frac{\pi}{4} + 2k\pi \right)$.

11. (a) $\sqrt{3} + i, -\sqrt{3} - i$.
 (b) $\exp\left(\frac{3\pi i}{8}\right), \exp\left(\frac{7\pi i}{8}\right), \exp\left(\frac{11\pi i}{8}\right), \exp\left(\frac{15\pi i}{8}\right)$

12. $0, 2, -1 + i\sqrt{3}, -1 - i\sqrt{3}$

13. All z_1 and z_2 where $\overline{z_2} = z_1$.

14. real numbers.

15. Write out the expression using the definition of the modulus.

16. Write out the expression using the definition of the complex conjugate.

17. (a) -1 .

(b) $2 \arctan a$.

18. The straight line through a parallel with the line through 0 and b .

20. $I_1 = -\frac{2}{27}\pi^2$ and $I_2 = \frac{2}{9}\pi\sqrt{3}$.

22. $\operatorname{Im}\left(-\frac{1}{z}\right) = \operatorname{Im}\left(-\frac{\bar{z}}{z\bar{z}}\right) = \frac{\operatorname{Im} z}{z\bar{z}} > 0$.

23. Opmerking: punten waarvan het product van de afstanden toe twee vaste punten constant is vormen een zogenaamde Cassini ovaal. Google maar eens.

(a) Not connected

(b) Yes

(c) Not connected

(d) Yes

(e) Yes

B-C 9.2. (a) $2\pi/3$;

(b) π .

B-C 11.2. $\pm\sqrt{3} - i, 2i$.

B-C 11.3. $\pm(\sqrt{3} - i), \pm(1 + \sqrt{3}i)$.

B-C 11.4. (b) $\pm\sqrt{2}, \pm\frac{1+\sqrt{3}i}{\sqrt{2}}, \pm\frac{1-\sqrt{3}i}{\sqrt{2}},$

B-C 11.6. $(z^2 + 2z + 2)(z^2 - 2z + 2)$.

B-C 12.1. Only (b) and (c) are domains.

B-C 12.2. Only (e).

B-C 12.3. Only (a).

B-C 12.5. No.