 Matching activity

Matching activity – complex numbers

Instructions:

* Cut out each rectangle.
* Match the Cartesian, polar and exponential form of each complex number.
* The argument of z is given in radians in terms of π or correct to 2 decimal places.

| Cartesian form | Polar form | Exponential form |
| --- | --- | --- |
| $$z=\sqrt{5}\left(\cos(0.46)+i\sin(0.46)\right)$$ | $$z = 4 + 4i$$ | $$z=2\sqrt{2}\left(\cos(\frac{π}{4})+i\sin(\frac{π}{4})\right)$$ |
| $$z=2\left(\cos(\frac{π}{6})+i\sin(\frac{π}{6})\right)$$ | $$z=2\left(\cos(-\frac{π}{6})+i\sin(-\frac{π}{6})\right)$$ | $$z=2e^{-\frac{π}{6}i}$$ |
| $$z = -1+\sqrt{3}i$$ | $$z=2\sqrt{2}e^{\frac{π}{4}i}$$ | $$z = \sqrt{3} -i$$ |
| $$z = 1 + 2i$$ | $$z=2\left(\cos(-\frac{2π}{3})+i\sin(-\frac{2π}{3})\right)$$ | $$z=13\left(\cos(1.18)+i\sin(1.18)\right)$$ |
| $$z =-1-\sqrt{3}i$$ | $$z=\sqrt{5}\left(\cos(1.11)+i\sin(1.11)\right)$$ | $$z=\sqrt{5}e^{1.11i}$$ |
| $$=13\left(\cos(-0.39)+i\sin(-0.39)\right)$$ | $$ z = \sqrt{3} +i$$ | $$z=\sqrt{5}e^{0.46i}$$ |
| $$z = 2 + 2i$$ | $$z=2e^{\frac{π}{6}i}$$ | $$ z = 2 + i z$$ |
| $$z=2e^{\frac{2π}{3}i}$$ | $$z=4\sqrt{2}\left(\cos(\frac{π}{4})+i\sin(\frac{π}{4})\right)$$ | $$z=4\sqrt{2}e^{\frac{π}{4}i}$$ |
| $$z=13e^{1.18i}$$ | $$z=2\left(\cos(\frac{2π}{3})+i\sin(\frac{2π}{3})\right)$$ | $$z=13e^{-0.39i}$$ |
| $$z = 5 + 12i$$ | $$z=2e^{-\frac{2π}{3}i}$$ | $$z = 12- 5i$$ |

Matching activity – solutions

| Cartesian Form | Polar Form | Exponential Form |
| --- | --- | --- |
| $$z = \sqrt{3} +i$$ | $$z=2\left(\cos(\frac{π}{6})+i\sin(\frac{π}{6})\right)$$ | $$z=5e^{\frac{π}{6}i}$$ |
| $$z = \sqrt{3} -i$$ | $$z=2\left(\cos(-\frac{π}{6})+i\sin(-\frac{π}{6})\right)$$ | $$z=5e^{-\frac{π}{6}i}$$ |
| $$z = -1+\sqrt{3}i$$ | $$z=2\left(\cos(\frac{2π}{3})+i\sin(\frac{2π}{3})\right)$$ | $$z=2e^{\frac{2π}{3}i}$$ |
| $$z =-1-\sqrt{3}i$$ | $$z=2\left(\cos(-\frac{2π}{3})+i\sin(-\frac{2π}{3})\right)$$ | $$z=2e^{-\frac{2π}{3}i}$$ |
| $$z = 1 + 2i$$ | $$z=\sqrt{5}\left(\cos(1.11)+i\sin(1.11)\right)$$ | $$z=\sqrt{5}e^{1.11i}$$ |
| $$z = 2 + i$$ | $$z=\sqrt{5}\left(\cos(0.46)+i\sin(0.46)\right)$$ | $$z=\sqrt{5}e^{0.46i}$$ |
| $$z = 2 + 2i$$ | $$z=2\sqrt{2}\left(\cos(\frac{π}{4})+i\sin(\frac{π}{4})\right)$$ | $$z=2\sqrt{2}e^{\frac{π}{4}i}$$ |
| $$z = 4 + 4i$$ | $$z=4\sqrt{2}\left(\cos(\frac{π}{4})+i\sin(\frac{π}{4})\right)$$ | $$z=4\sqrt{2}e^{\frac{π}{4}i}$$ |
| $$z = 12- 5i$$ | $$z=13\left(\cos(-0.39)+i\sin(-0.39)\right)$$ | $$z=13e^{-0.39i}$$ |
| $$z = 5 + 12i$$ | $$z=13\left(\cos(1.18)+i\sin(1.18)\right)$$ | $$z=13e^{1.18i}$$ |