1. $\overrightarrow{a} = 2 \times \begin{bmatrix} 3 \\ 1 \end{bmatrix} - \begin{bmatrix} 5 \\ 6 \end{bmatrix}$
   $= \begin{bmatrix} 6 \\ 2 \end{bmatrix} - \begin{bmatrix} 5 \\ 6 \end{bmatrix}$
   $= \begin{bmatrix} 1 - 4 \end{bmatrix}$
2. $\overrightarrow{b} = 4 \times \begin{bmatrix} 1 \\ 0 \end{bmatrix} + 3 \times \begin{bmatrix} 0 \\ 1 \end{bmatrix}$
   $= \begin{bmatrix} 4 \\ 0 \end{bmatrix} - \begin{bmatrix} 0 \\ 3 \end{bmatrix}$
   $= \begin{bmatrix} 43 \end{bmatrix}$
3. $\begin{bmatrix} -3 \\ 4 \end{bmatrix}$
   $r = \sqrt{-3^2 + 4^2}$
   $= \sqrt{9 + 16} = 5$
   $\theta = \arctan\left(\frac{4}{-3}\right)$
   $\theta = -0,93$
4. $\begin{bmatrix} \frac{1}{\sqrt{3}} \\ \sqrt{\frac{2}{3}} \end{bmatrix}$
   $r = \sqrt{\frac{1}{\sqrt{3}}^2 + \sqrt{\frac{2}{3}}^{-2}} = 1$
   $\theta = \arctan\left(\frac{\sqrt{\frac{2}{3}}}{\frac{1}{\sqrt{3}}}\right)$
   $\theta = 0,96$
5. $|\overrightarrow{a}| = \sqrt{-8^2 + -15^2}$
   $= \sqrt{64 + 225}$
   $= 17$ $\theta = \arctan \frac{-8}{-15}$
   $= 0,49$
6. $(1 + 3i) + (4 + 4i)$
   $= (1 + 4) + (3i + 4i)$
   $= (5 + 7i)$
7. $(2 - i) + (-2 + i)$
   $= (2 - 2) + (-i + i)$
   $= 0$
8. $(i) + (3) = 3 + i$
9. $(5 + 2i)(5 - 2i)$
   $= 25 - 10i + 10i - 4$
   $= 21$
10. $(2 - 7i)(3 - 2i)$
    $= 6 - 4i - 21i + 14i$
    $= 6 - 25i - 14i$
    $= -8 - 25i$

11. $1 + 4i = \overline{1 + 4i} = 1 - 4i$

12. $\overline{-4 - 2i} = -4 + 2i$

13. $1 + i$
    $|z| = \sqrt{1 + 1}$
    $= \sqrt{2}$

14. $5 - 12i = \sqrt{5^2 + -12^2}$
    $= \sqrt{25 + 144}$
    $= \sqrt{169}$
    $= 13$

15. $5 - 12i$
    $r = \sqrt{2}$
    $\theta = \arctan(1)$
    $= \frac{\pi}{4}$

16. $1 - i$
    $r = \sqrt{2}$
    $\theta = \arctan(-1)$
    $= -\frac{\pi}{4}$
    $\sqrt{2}e^{-i\frac{\pi}{4}}$

17. $r = \sqrt{25} = 5$
    $\theta = \arctan\left(\frac{5}{0}\right)$
    $= \frac{\pi}{2}$
    $= 3e^{i\frac{\pi}{2}}$

18. $\overline{e^{i\frac{\pi}{2}}} = e^{-i\frac{\pi}{2}}$

19. $4e^{i\pi}$
    $y = r\sin\theta$
    $= 4\sin(\pi)$
    $= 0$

    $x = r\cos\theta$
    $= 4\cos(\pi)$
    $= -4$

    $4(\cos(\pi) + i\sin(\pi))$
    $4(-1 + i \times 0)$
    -4

    $|z| = \sqrt{4^2 + 0^2}$
    $= 2$

20. $\beta = 7e^{i\frac{\pi}{2}}e^{-i\frac{\pi}{3}}$
    $= 7(\cos\left(\frac{\pi}{2}\right) + i\sin\left(\frac{\pi}{2}\right)) \times 1(\cos\left(\frac{\pi}{3}\right) - i\sin\left(\frac{\pi}{3}\right))$
    $= 7(1 + i0) \times 1(-\frac{1}{2} - i\frac{\sqrt{3}}{2})$
    $= 7 \times (-\frac{\sqrt{4}}{2}i)$

$= 7i$

$|z| = \sqrt{7^2 + 0^2}$
$= \sqrt{7^2}$
$= 7$

note:

I $e^{i\frac{\pi}{2}} = -1$

II $ke^{i\theta}$
for: $k = constant\,\mathbb{R}, \theta = rad$

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