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maths friday afternoons Exam 2. 11/12/2020

b) Polar form

$$5x^2 = -3x - 12.$$

$$5x^2 + 3x + 12 = 0.$$

$$x^2 = \frac{-b \pm \sqrt{D}}{2a}$$

$$a=5 \quad b=3 \quad c=12.$$

$$D = b^2 - 4ac.$$

$$D = 3^2 - 4 \times 5 \times 12 = -231.$$

$$x = \frac{-3 - \sqrt{-231}}{2 \times 5} = -\frac{3}{10} \text{ and } -\frac{\sqrt{231}}{10}$$

$$x^2 = \frac{-3 \pm \sqrt{-231}}{2 \times 5} = -\frac{3}{10} \pm \frac{\sqrt{231}}{10}.$$

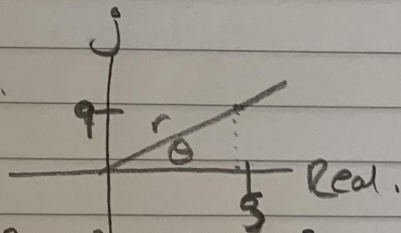
$$x = -\frac{3}{10} - \frac{\sqrt{231}}{10}$$

$$x = -\frac{3}{10} + \frac{\sqrt{231}}{10}.$$

c) de Moivre's theorem (

$$i) (5 - 9j)^5 = 65900 + 95076j.$$

$$r^n (\cos n\theta + j \sin n\theta)$$



$$r^2 = 9^2 + 5^2.$$

$$r^2 = 106. \quad r = 10.29$$

$$\tan \theta = \frac{9}{5} = 60.94^\circ$$

$$(10.29)^5 (\cos 5 \times 60.94^\circ + j \sin 5 \times 60.94^\circ)$$

$$115365.74 ($$