

Answer key for the first 13 problems

1) $f(x) = x^4 - 5x^3 + 22x^2 - 12x - 40$

2) $x \in \left\{ \frac{1}{3}, -4, 2+3i, 2-3i \right\}$

3) $x^2 + y^2 = x - y$

4) $(r, \theta) = \left(2, \frac{8\pi}{3} \right)$

5) $(x, y) = (-\sqrt{3}, 1)$

6) $-4i = 4 \left(\cos \frac{3\pi}{2} + i \sin \frac{3\pi}{2} \right)$

7) -64

8) Vertex $(-1, 2)$

Focus $(-1, 0)$

Directrix ~~is~~ $y = 4$

9) Center $(-2, 1)$

Foci $\left(-\frac{22}{5}, 1 \right), \left(\frac{2}{5}, 1 \right)$

Vertices $(-5, 1), (1, 1)$

10) Center $(1, 0)$

foci $\left(1 - \frac{\sqrt{5}}{2}, 0 \right), \left(1 + \frac{\sqrt{5}}{2}, 0 \right)$

Vertices $(\frac{1}{2}, 0)$, $(\frac{3}{2}, 0)$

Asymptotes $y = 2x - 2$, $y = -2x + 2$

11) $a_1 = -3$
 $d = -5$
 $a_n = 2 - 5n$

12) $a_n = 3 \cdot 2^{n-1}$

13) converges, sum = $\frac{5}{2}$

Some other problems for review

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