

1) Given: $f(x) = 5x - x^2$ find the difference quotient $\frac{f(x+h) - f(x)}{h}$

2) Determine the domain of the function: $f(x) = \sqrt{1-2x}$

3) Given $g(x) = x^2 - 3x$ and $h(x) = 2x - 5$ find $h(g(1))$

4) Divide by long division: $(6x^3 - 16x^2 + 17x - 6) \div (3x - 2)$

5) Write the quotient in standard form: $\frac{2}{4-5i}$

6) Find all the real zeros of $f(x) = 4x^3 + 3x^2 + 8x + 6$

7) State the vertical and horizontal asymptotes of the function: $f(x) = \frac{x^2}{x^2 - 9}$

8) Perform the indicated operation and simplify: $(10-8i)(2-3i)$

9) Solve for x, approximate the solution to 4 decimal places: $\ln(4x) = 1$

10) Solve for x, approximate the solution to 4 decimal places: $6^x + 10 = 47$

11) Evaluate: $\cos \frac{4\pi}{3}$

12) Solve for x over the interval $[0, 2\pi)$ $\sin x = -\frac{1}{2}$

13) Find the period of the function: $f(x) = \tan 3x$

14) Find the exact value: $\tan(\arccos \frac{2}{3})$

15) Solve the system graphically:
$$\begin{cases} 3x - 2y = 0 \\ x^2 - y^2 = 4 \end{cases}$$

16) Write the partial fraction decomposition for: $\frac{3}{x^2 + x - 2}$

17) State the center and radius of the circle: $x^2 + y^2 - 6x + 4y + 9 = 0$

18) Find the Limit: $\lim_{x \rightarrow 2} \frac{x^2 - 4}{x - 2}$

19) Find the sum: $\sum_{i=1}^5 (2i + 1)$

20) Given the terms of a sequence: 2, 5, 8, 11 Find the 50th term.

Answers:

1) $5 - 2x - h$

2) $x \leq \frac{1}{2} \quad \text{or} \quad (-\infty, \frac{1}{2}]$

3) -9

4) $2x^2 - 4x + 3$

5) $\frac{8}{41} + \frac{10}{41}i$

6) $x = 1, -1 \pm \sqrt{6}$

7) V.A. $x = 3, x = -3$, H.A. $y = 1$

8) $-4 - 46i$

9) $x \approx 0.6796$

10) $x \approx 2.0153$

11) $-\frac{1}{2}$

12) $\frac{7\pi}{6}, \frac{11\pi}{6}$

13) $\frac{\pi}{3}$

14) $\frac{\sqrt{5}}{2}$

15) $(1.11, 1.66)$

16) $\frac{-1}{x+2} + \frac{1}{x-1}$

17) *center* $(3, -2)$ $r = 2$

18) 4

19) 35

20) 149