

Show all your work for credit. Give exact answers whenever possible.

1. Solve the following equations or inequality for x .

a. $3 \log_3 x - \log_3 x^2 = 2$

1a. _____

b. $3^{2x} - 10 \cdot 3^x + 9 = 0$

1b. _____

c. $6x^2 - 5x \geq 6$

1c. _____

d. $x = \sqrt{x-2} + 2$

1d. _____

e. $|2 - 2x| < 7$

1e. _____

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

2. _____

3. Let $f(x) = x^2 - 3$ and $g(x) = x + 5$. Find $f(g(x))$.

3. _____

4. Give the first three terms in the expansion of $(a + b)^{15}$

4. _____

5. Perform the operation: $(2 - \sqrt{2}i)(5 + \sqrt{-8})$
(Note that $i^2 = -1$)

5. _____

6. Find the center and radius of the circle defined by $x^2 + y^2 - 2x - 6y = 5$

6. _____

7. Find the equation of the line that is perpendicular to $2x - 3y = 1$ and passes through $(-4, 8)$. Express your answer in slope-intercept form.

7. _____

8. Find the 601st term of the arithmetic sequence $-10, -5, 0, 5, \dots$

8. _____