

**PROFESSOR ALFRED DOLICH MATH 14 FINAL
REVIEW**

(1) Simplify:

$$\left(\frac{3x^2y}{y^3}\right)^5$$

(2) Multiply:

$$(5 - 2x) \cdot (x^2 - 3x + 2)$$

(3) Factor: $45x^3 + 8x^2 - 4x$

(4) Subtract:

$$\frac{x - 3}{x^2 - 25} - \frac{x - 3}{x^2 + 9x + 20}$$

(5) Simplify: $\sqrt[3]{3x} - 2\sqrt[3]{24x} + \sqrt[3]{275x}$

(6) Solve:

$$\frac{1}{x - 4} - \frac{1}{x - 3} = \frac{1}{x - 2} - \frac{1}{x - 1}$$

(7) Write

$$\frac{2 - 5i}{4 - 7i}$$

in standard form.

(8) Solve: $4y^2 + 4y + 5 = 0$.

(9) Solve:

$$\sqrt{x - 3} = \sqrt{2x - 5} - 1$$

(10) Solve: $6 - x \leq 3x + 10$ and $7x - 14 \leq 3x + 14$.

(11) Solve:

$$\left|\frac{3}{5}x - 2\right| \leq 4$$

(12) Find the distance between $(3, 5)$ and $(-1, 3)$.

(13) Determine any symmetry of the graph of the equation:

$$x^2y^2 + 2xy = 1$$

(14) Find the equation of a line perpendicular to the line $y = -2x + 3$ and passing through the point $(0, 7)$.

(15) Find the domain of:

$$h(x) = \frac{x}{\sqrt{2-x}}$$

(16) Determine whether the function:

$$f(x) = \frac{3x^2 + 7}{x - 3}$$

is even odd or neither.

(17) Sketch the graph of $f(x) = -\sqrt{-x} + 2$.

(18) Let $f(x) = 2x^2 - 1$ and $g(x) = 2 - x$. Find $g \circ f(x)$ and $f \circ g(x)$.

(19) Verify that

$$f(x) = 2 - 3x \text{ and } g(x) = \frac{2-x}{3}$$

are inverses to one another.

(20) Find the equation of a quadratic function in standard form which has vertex $(-3, 0)$ and passes through the point $(-5, -4)$.

(21) Sketch the graph of $f(x) = x(x+1)(x-1)(x+2)$.

(22) Find the quotient and remainder when $x^4 - 3x^3 + 2x^2 + 4x + 5$ is divided by $x^2 - 2$.

(23) Sketch the graph of:

$$g(x) = \frac{x^2 - 4}{x^2 - 9}$$

(24) Solve:

$$\frac{x-2}{2x+1} < -1$$

(25) Sketch the graph of -2^{x+1} .

(26) Determine how long it will take your principal to double if you invest it at 4.2% compounded continuously.

(27) Solve:

$$\log_{27} \sqrt[3]{1-x} = \frac{1}{3}$$

(28) Write in condensed form:

$$\frac{1}{5}(\log_2 z + 2 \log_2 y)$$

(29) Solve

$$2 \cdot 3^{4x-5} - 7 = 10$$

(30) Solve

$$\log_4(x^2 - 7x + 14) = 1$$

(31) Find the equation of a parabola in standard position with focus $(0, 4)$ and directrix $y = 4$.

(32) Sketch the graph of:

$$\frac{x^2}{9} + y^2 = 1$$

(33) Find the equation of the hyperbola with vertices $(\pm 2, 0)$ and foci $(\pm 3, 0)$.