

Review Exercises for Calculus

These problems should be done without calculators

1. Simplify the following expressions

$$(a) (16)^{4/3} \frac{(x^4 y^2)^3}{x^3 y^2} \quad (b) x^2 \sqrt{25x^{12}y^8} \quad (c) \frac{x^2 + 7x + 10}{x^2 - 2x - 8}$$

2. In each case solve for real x .

$$(a) \frac{3}{x+4} = \frac{2}{x} \quad (b) 5x = \sqrt{4x^2 + x^4} \quad (c) x^4 - x^2 - 2 = 0 \quad (d) 5x^3 - 2x^2 - x = 0$$

3. In each case solve the inequality for x .

$$(a) \frac{(2x-8)(5-x)}{x^2+6x+9} \leq 0 \quad (b) |2x-6| > \frac{1}{3}$$

4. Draw the graph of the line $3x - 2y = 6$, including the slope of the line and both x and y intercepts.

5. In each case determine the domain of the function

$$(a) f(x) = \sqrt{4-x^2} \quad (b) g(x) = \frac{x+4}{x^3-16x} \quad (c) h(x) = \log_{10}(x+\pi)$$

6. In each case draw the graphs of the function, noting intercepts

$$(a) f(x) = x^2 - 3 \quad (b) g(x) = \cos(x - \pi/2) \quad (c) h(x) = \tan(x - \pi/4)$$

7. In each case find the numerical value

$$(a) \sin(\pi/3) \quad (b) \tan(5\pi/4)$$

8. Suppose that $\tan x = 2$ and that $0 < x < \pi/2$. Find the numerical value of $\cos x$.

9. Solve $\sin 2x = \cos x$, $0 \leq x \leq 2\pi$. (Note: There are 4 solutions.)