

HONOR CALCULUS SUMMER ASSIGNMENT

FOR EACH PROBLEM, SHOW THE WORK THAT LEADS TO YOUR SOLUTION. EVEN IF USING A CALCULATOR, WRITE THE EXPRESSION YOU TYPED IN.

1. Write an equation of a line passing through the point $(-2, 5)$ and parallel to the line $3x - 4y + 12 = 0$.

2. The vertices of a triangle are $A(-2, 0)$, $B(0, 6)$, and $C(4, 0)$. Find an equation of a line containing the median from vertex A to \overline{BC} .

3. Write an equation of a circle whose center is at $(2, -3)$ and tangent to the line $y = -1$.

4. Solve for x : $|x - 2| = 2x + 5$.

5. Solve the inequality $|6 - 3x| < 18$ and sketch the solution on the real number line.

6. Given $f(x) = x^2 + 3x$, find $\frac{f(x+h) - f(x)}{h}$ in simplest form.

7. Determine which of the following equations represent y as a function of x :

(1) $xy = -8$ (2) $4x^2 + 9y^2 = 36$

(3) $3x^2 - y = 1$ (4) $y^2 - x^2 = 4$

8. If $f(x) = x^2$ and $g(x) = \sqrt{25 - x^2}$, find $(f \circ g)(x)$ and indicate its domain.

9. Given the graphs of f and g in Figures 5.6-1 and 5.6-2, evaluate:

(1) $(f-g)(2)$ (2) $(f \circ g)(1)$ (3) $(g \circ f)(0)$

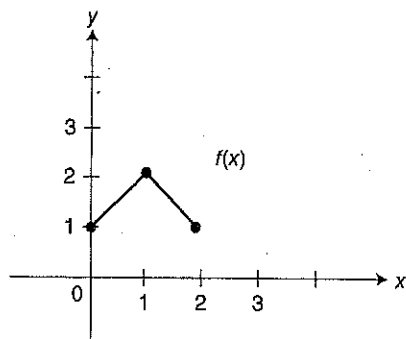


Figure 5.6-1

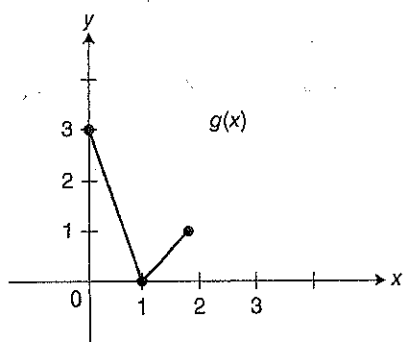


Figure 5.6-2

10. Find the inverse of the function $f(x) = x^3 + 1$.

11. Sketch the graph of the equation $y = 3 \cos\left(\frac{1}{2}x\right)$ in the interval $-2\pi \leq x \leq 2\pi$ and indicate the amplitude, frequency, and period.

12. On the same set of axes, sketch the graphs of:

(1) $y = \ln x$ (2) $y = \ln(-x)$
 (3) $y = -\ln(x+3)$

13. Solve the inequality $|2x + 4| \leq 10$.

14. Solve the inequality $x^3 - 2x > 1$.

15. Evaluate $\tan\left(\arccos \frac{\sqrt{2}}{2}\right)$.

16. Solve for x to the nearest thousandth:
 $e^{2x} - 6e^x + 5 = 0$.

17. Solve for x to the nearest thousandth:
 $3 \ln 2x - 3 = 12$.

18. Solve the inequality $\frac{2x-1}{x+1} \leq 1$.

19. Determine if the function
 $f(x) = -2x^4 + x^2 + 5$ is even, odd, or
neither.

20. Given the function $f(x) = x^4 - 4x^3$,
determine the intervals over which the
function is increasing, decreasing, or
constant. Find all zeros of $f(x)$, and
indicate any relative minimum and
maximum values of the function.

21. Given a linear function $y = f(x)$, with
 $f(2) = 4$ and $f(-4) = 10$, find $f(x)$.

22. Solve the inequality $x^3 - x \geq 0$
graphically.

23. If $f(x) = \frac{1}{x}$, $x \neq 0$, evaluate $\frac{f(x+h) - f(x)}{h}$ and express the answer in simplest form.

24. Given $g(x) = 3x - 12$, find $g^{-1}(3)$.

25. Write an equation of the tangent line to the graph of $x^2 + y^2 = 25$ at the point $(4, -3)$.