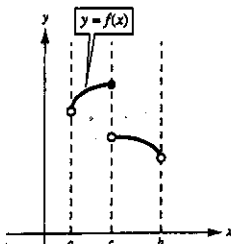


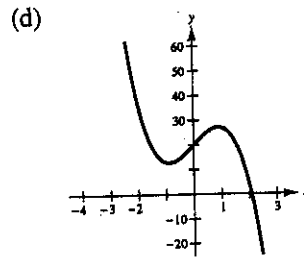
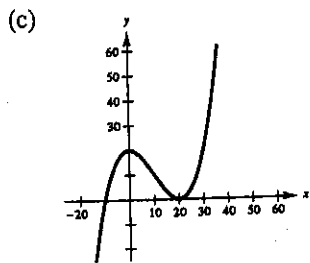
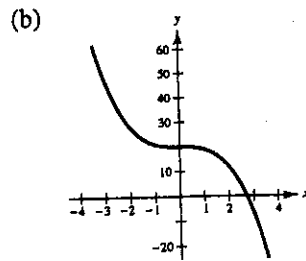
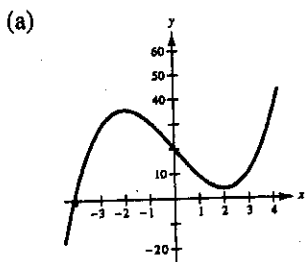
Multiple Choice (calculator –active section)

- Find all extrema in the interval $[0, 2\pi]$ if $y = x + \sin x$
 - $(-1, -1 + \frac{3\pi}{2}), (0, 0)$
 - $(2\pi, 2\pi), (0, 0)$
 - $(2\pi, 2\pi), (\pi, \pi)$
 - $(\pi, \pi), (0, 0)$
 - none of these
- Find all open intervals on which the function $f(x) = \frac{x}{x^2 + x - 2}$ is decreasing
 - $(-\infty, \infty)$
 - $(-\infty, 0)$
 - $(-\infty, -2)$ and $(1, \infty)$
 - $(-\infty, -2), (-2, 1)$ and $(1, \infty)$
 - none of these
- A farmer has 160 feet of fencing to enclose 2 adjacent rectangular pig pens. What dimensions should be used so that the enclosed area will be a maximum?
 - $4\sqrt{15}$ ft by $\frac{8}{5}\sqrt{15}$ ft
 - 40 ft by $\frac{80}{3}$ ft
 - 20 ft by $\frac{80}{3}$ ft
 - 40 ft by 40 ft
 - none of these
- Given that $f(x) = -x^2 + 12x - 28$ has a relative maximum at $x = 6$, choose the correct statement
 - f' is negative on the interval $(-\infty, 6)$
 - f' is positive on the interval $(-\infty, \infty)$
 - f' is negative on the interval $(6, \infty)$
 - f' is positive on the interval $(6, \infty)$
 - none of these
- Find the point on the graph of $y = \sqrt{x+1}$ closest to the point $(3, 0)$
 - $(0, 1)$
 - $(\frac{5}{2}, \sqrt{\frac{7}{2}})$
 - $(3, 2)$
 - $(2, \sqrt{3})$
 - none of these
- Given the function $f(x) = e^{\frac{x}{2}}$ on the closed interval $[-1, 4]$, if c is the number guaranteed by the mean value theorem, then c (correct to three decimal places) is approximately
 - 0.998
 - 1.163
 - 1.996
 - 2.065
 - 2.325
- A particle moves in a straight line such that its distance at time t from a fixed point on the line is given by $8t - 3t^2$ units. What is the total distance covered by the particle from $t = 1$ to $t = 2$?
 - 1 unit
 - $\frac{4}{3}$ units
 - $\frac{5}{3}$ units
 - 2 units
 - 5 units

Multiple Choice (non-calculator section)

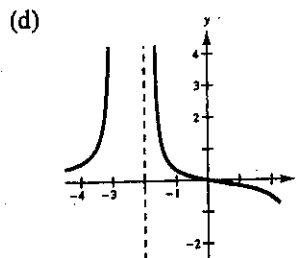
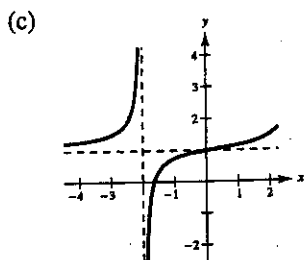
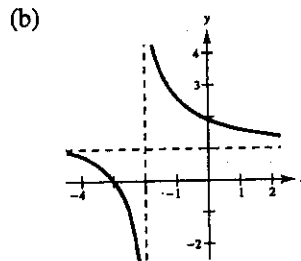
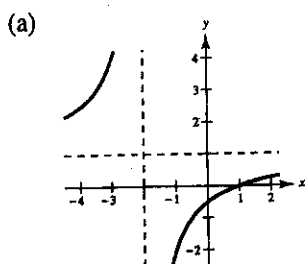
- Find all critical numbers for the function $f(x) = (9 - x^2)^{\frac{3}{5}}$
 - 0
 - 3
 - 3, 3
 - 3, 0, 3
 - none of these
- Find the values of x that give relative extrema for the function $f(x) = (x+1)^2(x-2)$
 - rel. max: $x = -1$; rel. min: $x = 1$
 - rel. max $x = 1, x = 3$; rel. min $x = -1$
 - rel. min $x = 2$
 - rel. max $x = -1$; rel. min $x = 2$
 - none of these
- Let $f''(x) = 3x^2 - 4$ and let $f(x)$ have critical numbers $-2, 0$, and 2 . Use the Second Derivative Test to determine which critical numbers, if any, gives a relative minimum
 - 2
 - 2
 - 0
 - 2 and 2
 - none of these
- Find all points of inflection: $f(x) = \frac{1}{12}x^4 - 2x^2 + 15$
 - (2,0)
 - (2,0), (-2,0)
 - (0,15)
 - $(2, \frac{25}{3}), (-2, \frac{25}{3})$
 - none of these
- State why Rolle's Theorem does not apply to the function $f(x) = \frac{2}{(x+1)^2}$ on the interval $[-2,0]$
 - f is not continuous on $[-2,0]$
 - $f(-2) \neq f(0)$
 - f is not differentiable at $x = -1$
 - Both a and c
 - none of these
- Let $f(x)$ be a polynomial function such that $f(-2) = 5$, $f'(-2) = 0$, and $f''(-2) = 3$. The point $(-2, 5)$ is a _____ of the graph of f
 - relative maximum
 - relative minimum
 - intercept
 - point of inflection
 - none of these
- If $V = \frac{4}{3}\pi r^3$, what is $\frac{dV}{dr}$ when $r = 3$?
 - 4π
 - 12π
 - 24π
 - 36π
 - 42π
- Determine from the graph whether f possesses extrema on the interval (a, b) .
 
 - Maximum at $x = c$, minimum at $x = b$
 - Maximum at $x = c$, no minimum
 - No maximum, minimum at $x = b$
 - No extrema
 - None of these

9. Which of the following is the correct sketch of the graph of the function $y = x^3 - 12x + 20$?



(e) None of these

10. Which of the following is the correct sketch of the graph of the function $f(x) = \frac{x-1}{x+2}$?



(e) None of these

11. The figure given in the graph is the second derivative of a polynomial function, f . Choose a graph of f .

