CALCULUS I – Worksheet #46

In problems 1 – 4, the motion of a particle on a straight line is given by $s = t^3 - 6t^2 + 12t - 8$.

1. The distance s is increasing for
   A) $t < 2$ B) all t except $t = 2$ C) $1 < t < 3$ D) $t < 1$ or $t > 3$ E) $t > 2$

---

2. The minimum value of the velocity occurs at t =
   A) 1 B) 2 C) 3 D) 0 E) none of these

---

3. The acceleration is positive
   A) when $t > 2$ B) for all t, $t \neq 2$ C) when $t < 2$ D) for $1 < t < 3$ E) for $1 < t < 2$

---

4. The velocity of the particle is decreasing for
   A) $t > 2$ B) $t < 3$ C) all t D) $t < 1$ or $t > 2$ E) $t < 2$

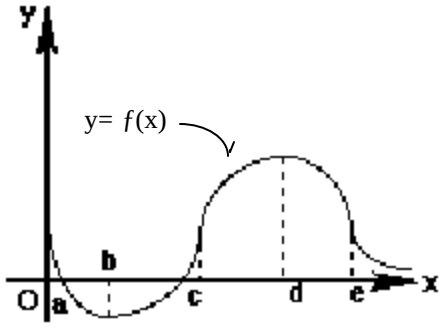
---

5. $\lim_{h \to 0} \dfrac{\cos\left(\frac{p}{2} + h\right)}{h}$ is: A) 1 B) nonexistent C) 0 D) – 1 E) none

---

6. On the graph of $y = f(x)$, $f'(x)$ and $f''(x)$ are both positive on which interval?

   A) $0 < x < a$ B) $b < x < c$ C) $c < x < d$ D) $d < x < e$ E) $x > e$



---

7. The area in the first quadrant bounded by the curve $y = x^2$ and the line $y - x - 2 = 0$ is equal to:
   A) $\frac{3}{2}$ B) $\frac{2}{3}$ C) $\frac{7}{6}$ D) $\frac{10}{3}$ E) $\frac{9}{2}$

---

8. Let $\begin{cases} f(x) = \dfrac{\sqrt{x+4} - 3}{x - 5} \\ f(5) = c \end{cases}$ if $x \neq 5$ and let f be continuous at x = 5. Then c =

   A) $-\frac{1}{6}$ B) 0 C) $\frac{1}{6}$ D) 1 E) 6

---

9. If $f(x) = x^5 + 2$, then its inverse function $f^{-1}(x)$ is

A) $\frac{1}{x^5 + 2}$ B) $\sqrt[5]{x + 2}$ C) $\sqrt[5]{x} + 2$ D) $\frac{1}{\sqrt[5]{x - 2}}$ E) $\sqrt[5]{x - 2}$
