CALCULUS I
Worksheet #73

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) $t < 1$ of $t > 2$　　E) $t < 2$
5.	$\lim\limits_{h \to 0} \dfrac{\cos\left(\dfrac{\pi}{2} + h\right)}{h}$ 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) $\dfrac{3}{2}$　B) $\dfrac{2}{3}$　C) $\dfrac{7}{6}$　D) $\dfrac{10}{3}$　E) $\dfrac{9}{2}$
8.	Let $f(x) = \begin{cases} \dfrac{\sqrt{x+4}-3}{x-5}; & x \neq 5 \\ c; & x = 5 \end{cases}$ and let f be continuous at $x = 5$. Then c = A) $-\dfrac{1}{6}$　B) 0　　C) $\dfrac{1}{6}$　　D) 1　　E) 6
9.	If $f(x) = x^5 + 2$, then its inverse function $f^{-1}(x)$ is A) $\dfrac{1}{x^5 + 2}$　B) $\sqrt[5]{x+2}$　C) $\sqrt[5]{x}+2$　　D) $\dfrac{1}{\sqrt[5]{x}-2}$　E) $\sqrt[5]{x-2}$
10.	A particle moves along a line so that at time t, where $0 \le t \le \pi$, its position is given by $s(t) = -4\cos t - \dfrac{t^2}{2} + 10$. What is the velocity of the particle when its acceleration is zero? A) -5.19　　B) 0.74　　C) 1.32　　D) 2.55　　E) 8.13
11.	The point on the curve $y = \sqrt{2x+1}$ at which the normal is parallel to the line $y = -3x+6$ is A) (4,3)　　B) (0,1)　　C) $(1, \sqrt{3})$　　D) (4,–3)　　E) $(2, \sqrt{5})$

Answers:

1. B	2. B	3. A	4. E	5. D	6. B	7. D	8. C	9. E	10. D	11. A