Average Value of a Function

Numberbender | WORKSHEET

Name: _____ Date: _____ Score: _____

Solve each problem. Show all work. All graphs must be done on graph paper.

CALCULUS I – Worksheet #43
All graphs must be done on graph paper!!

1	Find the area bounded by $y^2 = 4x$ and $y = 2x - 4$
2	Find the area bounded by $y = 2 - x^2$ and $y = x - 4$
3	Find the area under the curve $y = 2x + 1$ on $[0,2]$.
4	Find the average value of $f(x) = 5x^4 + 3x^2$ on the interval $-1 \le x \le 2$.
5	Find the average value of $f(x) = \sin x$ on the interval $[0, \pi]$.
6	Find the average value of $f(x) = \frac{1}{x}$ on the interval [e, 2e].
7	Find the average value of $y = 3x^2 + 2x$ on the interval [-1, 2]
8	Find the average value of $y = \frac{1}{1+x^2}$ on the interval [0, 1].
9	A circular conical reservoir has depth 20 feet and radius of the top 10 feet. Water is leaking out so that the surface is falling at the rate of $\frac{1}{2}\ \frac{\text{ft}}{\text{hr}}$ The rate, in cubic feet per hour, at which the water is leaving the reservoir when the water is 8 feet deep is (A) 4π (B) 8π (C) 16π (D) $\frac{1}{4\pi}$ (E) $\frac{1}{8\pi}$
10	Find c in $[-2,2]$ determined by Rolle's Theorem for $f(x) = x^4 - 4x^2$.
11	$f(x) = \begin{cases} \frac{x^3+8}{x+2} & \text{when } x \neq -2 \\ k & \text{when } x = -2 \end{cases}$ Find k so that f is continuous at $x = -2$
12	If $h(x) = \sqrt{x-4}$, then $h^{-1}(x) =$ A) $\sqrt{x^2+4}$ B) $x^2 - 4$ C) $x + 4$ D) $\sqrt{x+4}$ E) $x^2 + 4$
13	If $y = \frac{1}{\sin(t+\sqrt{t})}$ then $y'(1) =$ A) $-\frac{3}{2}\sin 2 \cos 2$ B) $-2\frac{\cos 2}{\cdot\ 2\cdot}$ C) $-\frac{3\cos 2}{\cdot\ 2\cdot}$ D) $-\frac{1}{\cdot}\frac{\cos 2}{\cdot\ 2\cdot}$ E) $-2\tan 2$

Average Value of a Function

Numberbender | ANSWER KEY

Answer key — for instructor use only.

Answers:

1) 9	2) $\frac{125}{6}$	3) 6	4) 14	5) $\frac{2}{\pi}$	6) $\frac{\ln 2}{e}$	7) 4	8) $\frac{\pi}{4}$
9) B	10) $0, \pm\sqrt{2}$	11) 12	12) E	13) C			