Approximation II

Numberbender | WORKSHEET

Name: _____ Date: _____ Score: _____

Solve each problem. Show all work.

Calculus I
Worksheet #80

1.	$f(x) = x^4$ Find dy if a = 1 and dx = .1.
2.	Approximate using differentials: $\sqrt[4]{17}$
3.	Approximate the change in the volume of a cube if a side is 5 cm has an error of .1 cm. ($V = x^3$)
4.	The edge of a cube is measured as 10 cm with a possible error of 1%. The cube's volume is to be measured from this estimate. Estimate the percentage error in the volume calculation.
5.	Approximate using differentials and find dy for $(8.4)^{4/3}$
6.	Find formula for the approximate Change in the surface area of a cube when the edges all change by an amount dx.
7.	A circle is drawn with a radius of 2.25 inches. If the radius is made 2.27 inches instead, approximate the change in circumference of the circle.
8.	If $f(x) = \int_1^{x^3} (t^3 - t)dt$, then $f\text{ ‘‘ }(1) =$ A) 18 B) 8 C) 6 D) $\frac{1}{2}$ E) 0
9.	The absolute maximum of the function f(x) = sin x – cos x on the closed interval [0, π] is A) – 1 B) $\sqrt{2}$ C) π D) $\frac{3\pi}{4}$ E) 0
10.	If $f(x) = \frac{1}{x^2+1}$ and $g(x) = \sqrt{x}$, then the derivative of $f(g(x))$ is …. A) $\frac{-\sqrt{x}}{(x^2+1)^2}$ B) $-(x+1)^{-2}$ C) $\frac{-2x}{(x^2+1)^2}$ D) $\frac{1}{(x+1)^2}$ E) $\frac{1}{2\sqrt{x}(x+1)}$
11.	$\lim_{x\to 2} \frac{\sqrt{x^2-2} - \sqrt{-x+4}}{x-2}$
12.	If $f(x) = x^3 - 2x - 1$, then $f(-2) =$ A) –17 B) –13 C) –5 D) –1 E) 3
13.	$\int_0^{\frac{\pi}{2}} \cos^2 x \sin x\, dx =$ A) – 1 B) $-\frac{1}{3}$ C) 0 D) $\frac{1}{3}$ E) 1
14.	The acceleration of a particle moving along a straight line is given by a = 6t. If, when t = 0, its velocity, v, is 1 and its distance, s, is 3, then at any time t A) $s = t^3 + 3$ B) $s = t^3 + 3t + 1$ C) $s = t^3 + t + 3$ D) $s = \frac{t^3}{3} + t + 3$ E) $s = \frac{t^3}{3} + \frac{t^2}{2} + 3$

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Answer key — for instructor use only.

Answers:

1) 0.4	2) 2.031	3) 7.5 cm	4) 3%	5) 1.067
6) $dA = 12x\,dx$	7) 0.04π in	8) A	9) B	10) B
11) $\frac{5}{2\sqrt{2}}$	12) C	13) D	14) C	