

AP Calculus AB

Name: _____ Score: _____

1. The average value of f on $[a, b]$ is...

- ☐ $\int_a^b f \, dx$
- ☐ $(b - a) \int_a^b f \, dx$
- ☐ $\frac{1}{b - a} \int_a^b f \, dx$
- ☐ $f(b) - f(a)$

2. To recover position from velocity you...

- ☐ differentiate velocity
- ☐ square velocity
- ☐ take the reciprocal
- ☐ integrate velocity

3. The applied accumulation relationship is: final value =...

- ☐ initial value $+$ $\int_a^b R \, dt$
- ☐ initial value $\times \int_a^b R \, dt$
- ☐ $R(b) - R(a)$
- ☐ $\int_a^b R \, dt$

4. The area between an upper curve f and lower curve g on $[a, b]$ is...

- ☐ $\int_a^b (f \cdot g) \, dx$
- ☐ $\int_a^b f \, dx$
- ☐ $\int_a^b (g - f) \, dx$
- ☐ $\int_a^b (f - g) \, dx$

5. With horizontal slices, the area is $\int_c^d (?) \, dy$ where...

- ☐ top minus bottom
- ☐ leftmost minus rightmost
- ☐ the product of the curves
- ☐ rightmost minus leftmost

6. Base under $y = \sqrt{x}$ on $[0, 4]$, square cross sections: $A(x) = x$. Find $V = \int_0^4 x \, dx$.

7. For a semicircle whose diameter is the base s , you must halve s to get the radius before squaring.

☐ True ☐ False

8. In the disc method, the radius R is the _____ from the curve to the axis of revolution.

9. When revolving about $y = -1$, you can still use radius $R = f(x)$.

☐ True ☐ False

10. Even about a shifted axis, the washer integrand is $R^2 - r^2$, not $(R - r)^2$.

☐ True ☐ False

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1. $\frac{1}{b-a} \int_a^b f \, dx$

Total divided by width.

2. **integrate velocity**

Position = initial + $\int v \, dt$.

3. **initial value** + $\int_a^b R \, dt$

Final = initial + accumulated change.

4. $\int_a^b (f - g) \, dx$

Upper minus lower, integrated.

5. **rightmost minus leftmost**

Horizontal strips: right curve minus left curve.

6. **8**

$$\left[\frac{x^2}{2}\right]_0^4 = 8.$$

7. **True**

Radius = $s/2$; forgetting this is a common error.

8. **distance**

Radius = distance to the axis.

9. **False**

You must shift: $R = f(x) + 1$.

10. **True**

Always square each radius before subtracting.