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

   ☐ $\int_a^b f\,dx$

   ☐ $(b-a)\int_a^b f\,dx$

   ☐ $\dfrac{1}{b-a}\int_a^b f\,dx$

   ☐ $f(b) - f(a)$

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. 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

5. Where do $y = x^3$ and $y = x$ cross?

   ☐ $x = 0$

   ☐ $x = -1$

   ☐ $x = 1$

   ☐ $x = 2$

   Tick every correct option.

6. The volume of a solid with cross-sectional area $A(x)$ is...

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   ☐ $\pi \int_a^b A(x)\,dx$

   ☐ $A(b) - A(a)$

   ☐ $\int_a^b \sqrt{A(x)}\,dx$

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

   _____

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

   ☐ True ☐ False

9. The washer integrand $R^2 - r^2$ is the same as $(R - r)^2$.

   ☐ True ☐ False

10. Evaluate $\int_0^3 \sqrt{1 + x}\,dx$ (a decimal).

    _____

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

   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. **rightmost minus leftmost**

   Horizontal strips: right curve minus left curve.

5. $x = 0$**;** $x = -1$**;** $x = 1$

   $x^3 = x \Rightarrow x(x-1)(x+1) = 0$.

6. $\int_a^b A(x)\,dx$

   Add up slabs $A(x)\,dx$.

7. **distance**

   Radius = distance to the axis.

8. **False**

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

9. **False**

   Square each radius first; $(R-r)^2$ is wrong.

10. **4.667**

    Put $u = 1 + x$, so $du = dx$ and the limits become $1, 4$. Then $L = \int_1^4 u^{1/2}\,du = [(2/3)u^{3/2}]_1^4 = (2/3)(8-1) = 14/3 \approx 4.667$.

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