CALCULUS 5: QUIZ SOLUTIONS

Question 1

If $f(x)=\frac{2}{x}$, what is $f'(x)$?

A. $f'(x)=2x^2$ B. $f'(x)=-2x^{-2}$ C. $f'(x)=2x^{-2}$

D. $f'(x)=-2x^2$

Solution

$$\begin{aligned} f(x)&=\frac{2}{x}\\ &=2x^{-1}\\ \therefore f'(x)&=(-1)2x^{-1-1}\\ &=-2x^{-2}\end{aligned}$$

So, the correct answer is B.

Question 2

If $g(x)=2\sqrt{x}$, what is $g'(x)$?

A. $g'(x)=2x^{-\frac{1}{2}}$ B. $g'(x)=2x^{\frac{1}{2}}$ C. $g'(x)=x^{\frac{1}{2}}$ D. $g'(x)=x^{-\frac{1}{2}}$

Solution

$$\begin{aligned} g(x)&=2\sqrt{x}\\ &=2x^{\frac{1}{2}}\\ \therefore g'(x)&=(\tfrac{1}{2})2x^{\frac{1}{2}-1}\\ &=x^{-\frac{1}{2}}\end{aligned}$$

So, the correct answer is D.

Question 3

If $h(x)=\frac{2}{\sqrt{x}}$, what is $h'(x)$?

A. $h'(x)=-3x^{\frac{1}{2}}$ B. $h'(x)=2x^{\frac{3}{2}}$ C. $h'(x)=-x^{-\frac{3}{2}}$ D. $h'(x)=x^{-\frac{3}{2}}$

Solution

$$\begin{aligned} h(x)&=\frac{2}{\sqrt{x}}\\ &=2x^{-\frac{1}{2}}\\ \therefore h'(x)&=(-\tfrac{1}{2})2x^{-\frac{1}{2}-1}\\ &=-x^{-\frac{3}{2}}\end{aligned}$$

So, the correct answer is C.

Question 4

If $f(x)=\sqrt{2x}$,what is $f'(x)$?

A. $f'(x)=\frac{\sqrt{2}}{2}x^{-\frac{1}{2}}$ B. $f'(x)=2x^{-\frac{1}{2}}$ C. $f'(x)=\sqrt{2}x^{-\frac{1}{2}}$ D. $f'(x)=\sqrt{2}x^{\frac{1}{2}}$

Solution

$$\begin{aligned} f(x)=\sqrt{2x} &= \sqrt{2}\times\sqrt{x} \\ &= \sqrt{2}x^{\frac{1}{2}} \\ \therefore f'(x) &= (\tfrac{1}{2})\sqrt{2}x^{\frac{1}{2}-1} \\ &= \tfrac{\sqrt{2}}{2}x^{-\frac{1}{2}} \end{aligned}$$

So, the correct answer is A.

Question 5

If $g(x)=\sqrt{2}$, what is $g'(x)$?

A. $\frac{1}{2}\sqrt{2}$ B. $g'(x)=0$ C. $g'(x)=2^{\frac{1}{2}}$ D. $g'(x)=(\frac{1}{2})2^{-\frac{1}{2}}$

Solution

$g(x)=\sqrt{2}$, which is a constant.

$\therefore g'(x)=0$

So, the correct answer is B.