If $f(z) = 2z$ and $g(x) = \dfrac{1}{x^2}$ what is $(g(f(z)))$.

(a) $\dfrac{2z}{x^2}$.

(b) $\dfrac{2}{z^2}$.

(c) $\dfrac{2}{x^2}$.

(d) $\dfrac{1}{4x^2}$.

(e) $\dfrac{1}{4z^2}$.

If $f(z) = 2z + 1$ and $g(x) = \frac{1}{x}$ what is $g(f(a))$?

1. $\frac{2}{x} + 1$
2. $\frac{2}{a} + 1$
3. $\frac{1}{2x + 1}$
4. $\frac{1}{1 + 2a}$
5. $\frac{1}{2a} + 1$

# answer

If $f(z) = 2z + 1$ and $g(x) = \dfrac{1}{x}$ then $f(g(a))$ is given by

(a) $\dfrac{2}{a} + 1.$

(b) $\dfrac{2}{x} + 1.$

(c) $\dfrac{1}{2a + 1}.$

(d) $\dfrac{1}{2x + 1}.$

(e) $\dfrac{1}{2a} + 1.$

# answer

$\log\left(x+\sqrt{1+x^2}\right)$ equals

(a) $\log x + \frac{1}{2}\log\left(1+x^2\right)$

(b) $\frac{1}{2}\log x \cdot \log\left(1+x^2\right)$

(c) neither

$\dfrac{\mathrm{d}}{\mathrm{d}x} \cosh\left(x^2+1\right)$ equals

(a) $\sinh\left(x^2+1\right)$

(b) $2x \sinh\left(x^2+1\right)$

(c) $-\sinh\left(x^2+1\right)$

(d) $-2x \sinh\left(x^2+1\right)$

(e) $\sinh x^3 + x$

Match the items in column 1 with the definitions in column 2.

| | | | |
|---|---|---|---|
| (a) | $\sinh x$ | (A) | $\left(e^{x}-e^{-x}\right)/2$ |
| (b) | $\cosh x$ | (B) | $1$ |
| (c) | $\cosh^2 x+\sinh^2 x$ | (C) | $1+2\sinh^2 x$ |
| (d) | $\operatorname{arccosh} x$ | (D) | $\left(e^{x}+e^{-x}\right)/2$ |
| (e) | $\cosh^2 x-\sinh^2 x$ | (E) | $\ln\left(x+\sqrt{x^2-1}\right)$ |

$\dfrac{\mathrm{d}}{\mathrm{d}x}\,(-2xy)$ equals

(a) $-2y'$

(b) $-2xy' + 2y$

(c) $-2xy' - 2y$

$\dfrac{\mathrm{d}}{\mathrm{d}x}\left(yy'\right)$ equals

(a) $y'y''$

(b) $y' + yy''$

(c) $\left(y'\right)^2 + yy''$