



MATHS

BOOKS - SAI MATHS (TELUGU ENGLISH)

HYPERBOLIC FUNCTIONS

Problems

1. If $\cosh 2x = 199$, then $\coth x =$

A. $\frac{5}{3\sqrt{11}}$

B. $\frac{5}{6\sqrt{11}}$

C. $\frac{7}{3\sqrt{11}}$

D. $\frac{10}{3\sqrt{11}}$

Answer: d



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2. If $2 \sinh^{-1} \left(\frac{a}{\sqrt{1-a^2}} \right) = \log \left(\frac{1+x}{1-x} \right)$

then $x =$

A. a

B. $\frac{1}{a}$

C. $\sqrt{1 - a^2}$

D. $\frac{1}{\sqrt{1 - a^2}}$

Answer: a



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$$3. \operatorname{sech}^{-1}\left(\frac{1}{2}\right) - \operatorname{cosech}^{-1}\left(\frac{3}{4}\right) =$$

A. $\log_e(3(2 + \sqrt{3}))$

B. $\log_e \left(\frac{1 + \sqrt{3}}{3} \right)$

C. $\log_e \left(\frac{2 + \sqrt{3}}{3} \right)$

D. $\log_e \left(\frac{2 - \sqrt{3}}{3} \right)$

Answer: c



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4. $\tanh^{-1} \left(\frac{1}{2} \right) + \coth^{-1}(2)$ is equal to

A. $\frac{1}{2} \log 3$

B. $\frac{1}{2}\log 6$

C. $\frac{1}{2}\log 12$

D. $\log 3$

Answer: d



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5. $x = \log \left(\frac{1}{y} + \sqrt{1 + \frac{1}{y^2}} \right) \Rightarrow y$ is equal to

A. $\tanh x$

B. $\coth x$

C. $\operatorname{sech} x$

D. $\operatorname{cosech} x$

Answer: d



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6. For $0 < x < \pi$, $\sinh^{-1}(\cot x)$ is equal to

A. $\log\left(\cot \cdot \frac{x}{2}\right)$

B. $\log\left(\tan \cdot \frac{x}{2}\right)$

C. $\log(1 + \cot x)$

D. $\log(1 + \tan x)$

Answer: a



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7. If $\tanh^{-1} x = a \log\left(\frac{1+x}{1-x}\right)$, $|x| < 1$,

then a is equal to

A. 1

B. 2

C. $\frac{1}{2}$

D. $\frac{1}{4}$

Answer: c

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8. $\sinh^{-1} 2 + \sinh^{-1} 3 = x \Rightarrow \cosh x$ is equal to

A. $\frac{1}{2} (3\sqrt{5} + 2\sqrt{10})$

B. $\frac{1}{2} (3\sqrt{5} - 2\sqrt{10})$

C. $\frac{1}{2} (12 + 2\sqrt{50})$

$$D. \frac{1}{2}(12 - 2\sqrt{50})$$

Answer: c



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9. $\frac{1 + \tanh. \frac{x}{2}}{1 - \tanh. \frac{x}{2}}$ is equal to

A. e^{-x}

B. e^x

C. $2e^{\frac{x}{2}}$

D. $2e^{-\frac{x}{2}}$

Answer: b



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10. $\operatorname{sech}^{-1}(\sin \theta)$ is equal to

A. $\log \tan. \frac{\theta}{2}$

B. $\log \sin. \frac{\theta}{2}$

C. $\log \cos. \frac{\theta}{2}$

D. $\log \cot. \frac{\theta}{2}$

Answer: d



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11. $e^{\log(\cosh^{-1}(2))}$ is equal to

A. $\log(2 - \sqrt{3})$

B. $\log(\sqrt{3} - 2)$

C. $\log(2 + \sqrt{3})$

D. $\log(2 + \sqrt{5})$

Answer: c



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12. $2 \tanh^{-1} \left(\frac{1}{2} \right)$ is equal to

A. 0

B. $\log 2$

C. $\log 3$

D. $\log 4$

Answer: c



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13. If $x = \log \left[\cot \left(\frac{\pi}{4} + \theta \right) \right]$ then the value of $\sinh x$ is

A. $\tan 2\theta$

B. $\tan 2\theta$

C. $\cot 2\theta$

D. $-\cot 2\theta$

Answer: b



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14. $\sinh^{-1}\left(2^{\frac{3}{2}}\right)$ is equal to

A. $\log(3 + \sqrt{8})$

B. $\log(3 - \sqrt{8})$

C. $\log(2 + \sqrt{18})$

D. $\log(\sqrt{8} + \sqrt{27})$

Answer: a



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15. $\sinh(ix)$ is equal to

A. $i \sin x$

B. $\sin ix$

C. $-i \sin x$

D. $i \sin ix$

Answer: a



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16. $\sinh^{-1} \left(\frac{x}{\sqrt{1-x^2}} \right)$ is equal to

A. $\cot h^{-1} x$

B. $\sinh^{-1} x$

C. $-\tanh^{-1} x$

D. $\tanh^{-1} x$

Answer: d



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