MATHS

BOOKS - SAI MATHS (TELUGU ENGLISH)

HYPERBOLIC FUNCTIONS

Problems

1. If cosh $2x = 199$, then cothx =

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

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

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 $0 < x < \pi$, $\sin h^{-1}(\cot x)$ is equal to

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

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

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 is a equal to

A. 1

B. 2

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

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

Answer: c

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

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

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

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

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

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

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

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

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

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

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 sinhx 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. $\log\left(3+\sqrt{8}\right)$

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

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

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

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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