

1. Simplify: $\sin\left(\frac{3\pi}{2} + \theta\right)$

2. If $\tan \theta = -\frac{12}{5}$ and θ lies in quadrant II, then what is the value of $\cos 2\theta$?

Simplify.

3. $\sec \theta \cos \theta + \sin \theta \csc \theta$

Verify each identity.

4. $\frac{\cos \theta}{\sec \theta + \tan \theta} = 1 - \sin \theta$

5. Simplify: $(\sin \theta + \cos \theta)^2 + 2 \sin \theta \cos \theta$

6. Simplify: $\frac{1 + \cos 2\theta}{2}$

Verify each identity.

7. $\frac{\sec \theta}{\tan \theta + \cot \theta} = \sin \theta$

Solve.

8. $2 \sin^2 \theta - 11 \sin \theta - 6 = 0$

9. Solve the following for x , where $0 \leq x < 2\pi$.
Answer in terms π .

$\cos x - 2 \sin x \cos x = 0$

Solve.

10. $2 \cos^2 \theta + \sin \theta = 2$

11. Solve: $(x + 1)^{\frac{3}{2}} = 64$

12. Solve: $|4x - 12| = 7x + 3$

Graph.

13.
$$g(x) = \begin{cases} x, & \text{if } x < 0 \\ -2, & \text{if } 0 \leq x < 1 \\ x^2, & \text{if } x \geq 1 \end{cases}$$

Given $f(x) = 2x + 5$, $g(x) = x^2 - 10$ and $h(x) = 3x - 8$, find the following.

14. $f(g(x))$

15. Given y varies jointly as x and the positive square root of z , and inversely as w . Also, $y = 3$ when $x = 2$, $z = 4$, and $w = 16$. Find y when $x = 15$, $z = 36$, and $w = 5$.

Use long division.

16. $(2c^4 - 6c^3 - 25c^2 + 48c + 72) \div (c^2 - 8)$

17. Given $x = -2$ is a root of $6x^3 + 11x^2 - 4x - 4 = 0$, factor the polynomial $P(x) = 6x^3 + 11x^2 - 4x - 4$.

Find all roots.

18. $x^3 - x^2 - 3x + 3 = 0$

Find all real solutions.

19. $x^4 - 8x^3 - 11x^2 + 18x = 0$

State all horizontal and vertical asymptotes of the function.

20. $g(x) = \frac{x^2 + 4x - 12}{x}$

21. Evaluate: $\log_{\frac{1}{3}} 27$

Write as the sum or difference of logarithms with no exponents.

22. $\log \left(\sqrt[5]{\frac{b^2 c}{d^4}} \right)$

Solve.

23. $9^{1-3x} = 27^{2x-1}$

24. $\log x + \log(x - 3) = 1$

25. Solve for x : $\log 64 = 2 \log x$

Solve.

26. $y^2 = 5 - x$
 $x + 5y = 11$

27. $x + 3y + z = 3$
 $2x + 5y - 2z = -4$
 $x + 6y + 2z = 0$

Find the sum, if it exists.

28. $\frac{7}{2} + \frac{7}{4} + \frac{7}{8} + \dots$

29. Find the sum of the series $14 + 11 + 8 + 5 + \dots - 82$.

30. If you flip a coin and pick a card from a standard 52-card deck, what is the probability you will get a head and a heart?

Answer List

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|--|--------------------------------------|---|
| 1. $-\cos \theta$ | 2. $-\frac{119}{169}$ | 3. 2 |
| 4. | 5. $1 + 2 \sin 2\theta$ | 6. $\cos^2 \theta$ |
| 7. | 8. $\frac{7\pi}{6}, \frac{11\pi}{6}$ | 9. $\frac{\pi}{6}, \frac{\pi}{2}, \frac{5\pi}{6}, \frac{3\pi}{2}$ |
| 10. $0, \frac{\pi}{6}, \frac{5\pi}{6}, \pi$ | 11. 15 | 12. $\frac{9}{11}$ |
| 13. | 14. $2x^2 - 15$ | 15. 216 |
| 16. $2c^2 - 6c - 9$ | 17. $(x+2)(3x-2)(2x+1)$ | 18. 1, $\pm\sqrt{3}$ |
| 19. 0, 9, -2, 1 | 20. $x = 0$ | 21. -3 |
| 22. $\frac{2}{5} \log b + \frac{1}{5} \log c - \frac{4}{5} \log d$ | 23. $x = \frac{5}{12}$ | 24. $x = 5$ |
| 25. 8 | 26. (1, 2), (-4, 3) | 27. (6, -2, 3) |
| 28. 7 | 29. -1122 | 30. $\frac{1}{8}$ |

Catalog List

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