Baby Mega Set # 1 DO NOT WRITE ON THIS PAPER!

Always round to 3 places after the decimal, unless it is exact.

1. The sum of the digits of a two-digit counting number is 9. When the digits are reversed, the new number is 9 less than the original number. What are the two numbers?

2. There were 35 nickels, dimes, and silver dollars in the pile, and their value was $12.25. How many coins of each kind were there if there were twice as many silver dollars as nickels?

3. How many liters of a solution that is 37% key ingredient should be added to 143 liters of a 73% solution to yield a 51% solution?

4. The number of greens exceeded the sum of the reds and blues by 9. The sum of the blues and greens exceeded 4 times the number of reds by 1. How many of each kind were there if there were 2 more reds than blues?

5. Sam strained and strained but could only garner $7\frac{1}{8}$. If this was only $\frac{2}{7}$ of what he wanted, how much did he want?

6. Find the equation of the line that passes through $(-2, 5)$ that is perpendicular to the line that passes through $(-4, -2)$ and $(5, 7)$.

7. Use the calculator to evaluate: (a) 0.6^8 (b) 0.04^{-6}

8. Sketch the function $y = 4^x$.

9. Sketch the function $y = (\frac{1}{3})^x$.

10. Draw the required triangle and evaluate $4\sqrt{3}\cos 60°$.

11. Draw the required triangle and evaluate $8\tan 45°$.

12. Solve: $\begin{cases} xy = 6 \\ x - y = 3 \end{cases}$

Factor:

13. $64a^3b^9 - 8p^3$

Simplify:

15. $\dfrac{\dfrac{a^3}{x^2 y} - \dfrac{6m^2}{y^2 x}}{\dfrac{l^2}{y^2} - \dfrac{6t}{x^2}}$

16. $\dfrac{\dfrac{3x}{4y - \dfrac{6z}{4 + \dfrac{k}{2l}}}}{}$

17. Solve for z: $2t = \dfrac{1}{3s^2}\left(\dfrac{5z}{6} - \dfrac{4m}{n}\right)$

18. Divide $x^4 - 2x + 1$ by $x - 2$ and check.

19. If the length of a rectangle is $3x + 2y$ and the perimeter is $10x + 6y$, what is the width of the rectangle?

Simplify:

20. $32^{\log_{32} 7}$

21. $3^{\log_3 6 - \log_3 2}$

22. $\dfrac{3 - 2\sqrt{12}}{1 - 3\sqrt{3}}$

Solve by completing the square:

23. $3x^2 = -4 + 5x$

24. $-6x + 9 = 4x^2$

Simplify:

25. $\dfrac{a^{2x} b^{3x}(\sqrt{a^3})^x}{b^{x-7}a}$

26. $(3x^{3a} - 2y^{a/2})(2y^{2a} - x^{2a})$

27. Solve: $7^{2x-4} = 5^{3x+2}$

28. Solve: $10^{3x-1} = 5^{4x-2}$

29. Evaluate $(1.41)^8$ by using the calculator.

30. Solve: $\log_8 16 - \log_8 4 = x$

Draw the triangles and evaluate:

31. $2\sin 135°$

32. $-2\cos(-300°)$

33. $3\cos 300° - \cos 60°$

34. $\sin(-150°) + \dfrac{\sqrt{3}}{2}\sin 30°$

35. Write $\log_m 8 = n$ in exponential form.
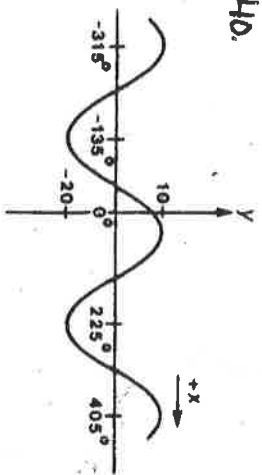
36. Write $7 = 3^k$ in logarithmic form.

37. $\log_b 64 = 3$
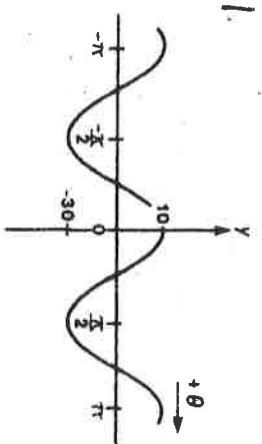
38. $\log_3 \dfrac{1}{27} = n$

39. $\log_{1/2} y = -2$

Write the equations of the following sinusoids in terms of the cosine function.

40.

41.

Solve:

42. $9^{3x-2} = 3^{2x-1}$

43. $x = \log_{1/3} 18 - \log_{1/3} 6$

44. $3 \log_6 x = \log_6 24 - \log_6 3$

45. $\log_{10} x + \log_{10}(x - 3) = 1$

46. $2 \log_2 x - \log_2 \left(x - \tfrac{1}{2}\right) = -\log_{1/3} 3$

47. Evaluate: $\sin\left[\operatorname{Arccos}\left(-\tfrac{1}{2}\right)\right]$

48. Evaluate: $\cos\left(\operatorname{Arctan} \tfrac{4}{5}\right)$

49. Find the equation of the line which passes through $(2, -1)$ and is parallel to $3y - 2x + 1 = 0$.

50. Find the equation of the line which passes through $(1, 2)$ and is perpendicular $\vdash$ $2y - 4x = 6$.
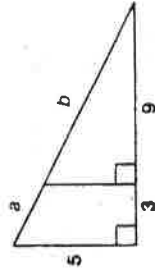
Simplify:

51. $\dfrac{x^{a+3}\left(\sqrt{x^3}\right)^{a+1}}{x^{3a-2}}$

52. $(3x^{1/3} - 6z^{1/2})(3x^{-1/3} + 6z^{-1/2})$

53. Evaluate: $\operatorname{Arcsin} \dfrac{\sqrt{3}}{2}$

54. Find a and b.

55. Find the area of this trapezoid in square meters. Dimensions are in centimeters.