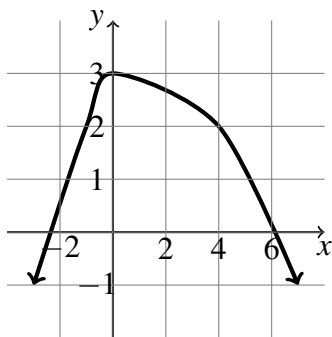


Directions:

- You should be able to answer all of these questions without the use of a calculator.
- You must show your work or demonstrate your reasoning to earn full credit. If you only write down the answer, you will only earn half-credit.
- For all graphing questions, your graph must be labeled. This includes labelling the axes, asymptotes, and at least a couple of points.

1. Evaluate $4^{-3/2}$.
2. Find the exact value of $\log_3 \frac{1}{27}$.
3. Find the exact value of $\sin(4\pi/3)$.
4. Simplify the expression $\left(\frac{4x^3y}{x^5y^{7/2}}\right)^2$. Write your answer without negative exponents.
5. Write an equation in slope-intercept form $y = mx + b$ for the line that passes through the points $(-3, 7)$ and $(3, -9)$.
6. Expand and simplify $(5x + 1)^2 - 8(x - 2)$.
7. Use the graph of $f(x)$ below to estimate the value(s) of x such that $f(x) = 2$.



8. For the function $f(x) = \frac{2}{x}$, find the expression $f(12 + h) - f(12)$. Simplify your answer and write your answer as a single fraction.
9. Given the piecewise defined function below, determine the value(s) of x such that $f(x) = -20$.
$$f(x) = \begin{cases} 2x + 3 & x < 0 \\ x^3 & x \geq 0 \end{cases}$$
10. Solve for x in the equation $x^2 + 3x = 10$.
11. Solve for x in the equation $e^{4-7x} = \frac{1}{2}$.

12. Find all solutions to the equation $2\cos(\theta) = 1$ in the interval $[0, 2\pi]$.

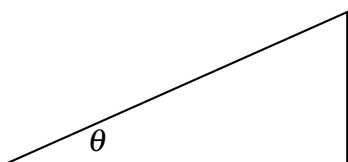
13. A table of values for the function $f(x)$ is given below. Use the table to determine $f^{-1}(5)$.

| | | | | | | | | | |
|--------|-----|----|----|----|----|----|----|----|------|
| x | -5 | 0 | 5 | 10 | 15 | 20 | 25 | 30 | 35 |
| $f(x)$ | 100 | 50 | 25 | 10 | 5 | 2 | 1 | -1 | -1/5 |

14. Solve the inequality $16 - x^2 \leq 0$. Give your answer in interval notation.

15. Determine the domain of $f(x) = \ln(x - 4)$. Give your answer in interval notation.

16. In the triangle below, $\sin \theta = \frac{2}{5}$. Determine $\cos \theta$.



Sketch graphs of the following functions. Label the x - and y -intercepts, if they exist. Draw in any asymptotes using dashed lines, and write the equation of the asymptote, if it exists.

17. $f(x) = (x + 1)^3$

18. $f(x) = 1 + e^x$

19. $y = \cos(x)$ on the interval $[-2\pi, 2\pi]$

20. Given the graph of $f(x)$ below, draw the graph of $-2f(x)$.

