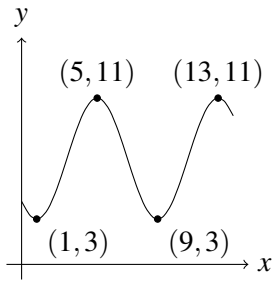
1. Solve. Write your answers in interval notation.
   (a.) $4b-5 \geq b+1$ **and** $7b+4 > 9b-6$
   (b.) Same as part (a), except with "or" instead of "and": $4b-5 \geq b+1$ **or** $7b+4 > 9b-6$
   (c.) $5|q-2|-7 \leq 8$
2. Consider the function $f(x) = \begin{cases} -x+3 & \text{if } x < 1, \\ -|x-5|+6 & \text{if } 1 \leq x < 9. \end{cases}$
   (a.) Sketch a graph of $y = f(x)$ by transforming functions that you know. Be sure to label your axes. Include and label any intercepts.
   (b.) Find the domain of $f(x)$. Write your answer in interval notation.
   (c.) Find the range of $f(x)$. Write your answer in interval notation.
3. Find the **domain** of each function. Write your answers in interval notation.
   (a.) $f(x) = \ln\left[\dfrac{2x-x^2}{x^2+4x-5}\right]$
   (b.) $g(x) = \sqrt{\dfrac{x+1}{x-2} - \dfrac{x+2}{x+3}}$
4. Consider the graph of $y = \dfrac{2(x-1)^2(x+3)}{(x+2)^2(x-4)} = \dfrac{2x^3+2x^2-10x+6}{x^3-12x-16}$.
   (a.) Find all x- and y-intercepts.
   (b.) Find all horizontal and vertical asymptotes.
   (c.) Sketch a graph. Be sure to label your axes. Include and label any intercepts, asymptotes, and holes.
5. Consider the graph of $y = \dfrac{x(x-3)(x-1)}{(x-3)(x+3)} = \dfrac{x^3-4x^2+3x}{x^2-9}$.
   (a.) Find the x- AND y-coordinates of any holes.
   (b.) Find all horizontal, vertical, and slant (oblique) asymptotes.
6. Find an equation for the graph below. Write your answer in the form $y = A\sin(Bx+C)+D$ OR $y = A\cos(Bx+C)+D$.



7. Sketch each graph. Draw and label axes, asymptotes, and intercepts.
   (a.) $y = 3^{x-2} - 4$
   (b.) $y = 2\ln(x+3) - 4$
8. Sketch each graph. Include **at least** two periods. Draw and label axes, asymptotes, and intercepts. Clearly show the coordinates of all local maxima and minima.

(a.) $y = 7\csc(3\pi x)$

(b.) $y = 5\cot(x/3)$

(c.) $y = -2\cos\left(3x - \dfrac{\pi}{2}\right)$

9. Suppose $\sin\theta = -\dfrac{3}{5}$ and angle θ measures between π and $3\pi/2$. Find the exact value of $\sin\left(\dfrac{\theta}{2}\right)$, $\cos\left(\dfrac{\theta}{2}\right)$, and $\tan\left(\dfrac{\theta}{2}\right)$.

10. Simplify each expression as much as possible. Remember to think about domains and ranges!

(a.) $\arccos\left[\sin\left(-\dfrac{\pi}{3}\right)\right]$

(b.) $\cot\left[\arccos\left(-\dfrac{1}{2}\right)\right]$

(c.) $\tan\left[\text{arcsec}\left(\dfrac{5}{2x}\right)\right]$

Hint: Draw a right triangle.

11. Find ALL real solutions to each equation.

(a.) $4\sin x = 2\sqrt{3}$

(b.) $5\cos x = -2$

(c.) $\cos x - \sin x = \dfrac{\sqrt{2}}{2}$

12. Verify the identity $\dfrac{\csc x}{\cot x + \tan x} = \cos x$. Remember to start with one side of the equation, then change it step-by-step to the other side. Tell me whether each step is ALGEBRA or a TRIG IDENTITY.

13. (a.) Simplify $\dbinom{30}{26}$. Your final answer should be a product of integers, e.g., $4 \cdot 7 \cdot 8$.

(b.) Find the coefficient of n^4m^5 when $(3n+m)^9$ is expanded. You may leave your answer in terms of factorials.