25 May 2018 Name: .

Classwork: Periodic functions

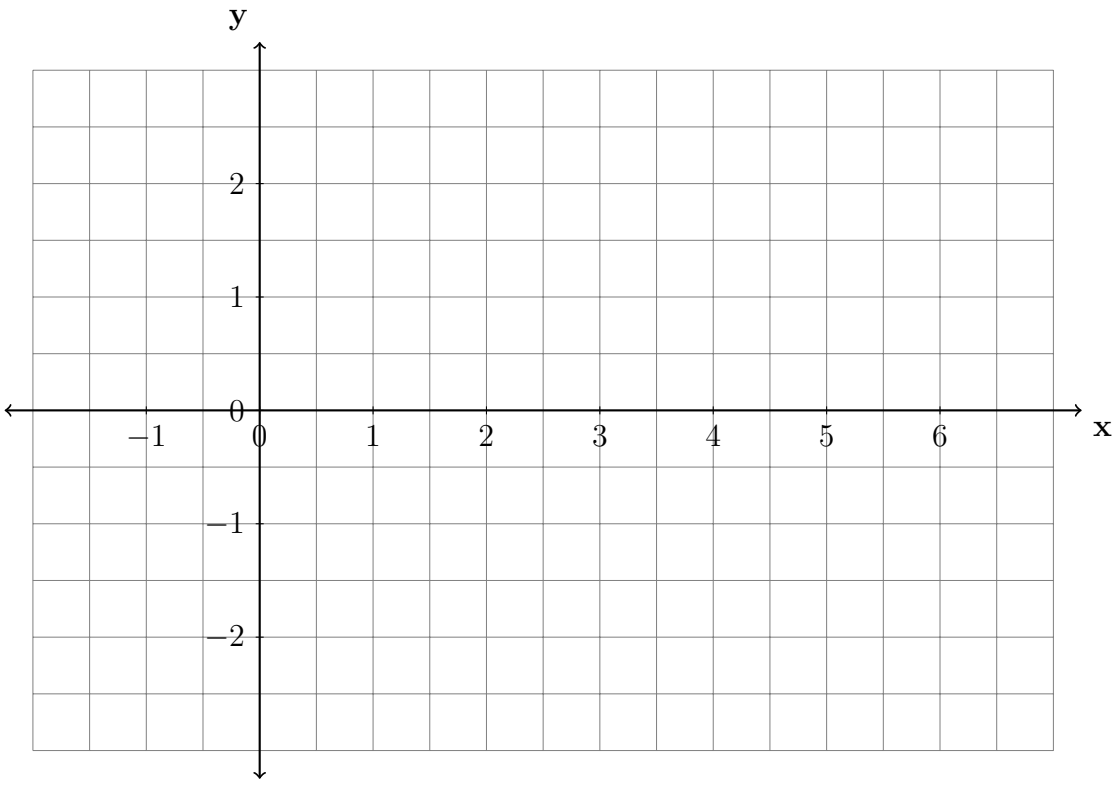
Graph carefully using pencil

1. Given the periodic function $f(x) = 2\sin(0.4\pi x) + 1$.

   (a) Using the calculator table function, complete the y values.
   What is the equation of the "midline" (the middle y value)?
   What is the "amplitude" (height from the middle to the top)?
   What is the "period" (length of the wave)?

x	$y = f(x)$
-1	
0	
1	
2	
3	
4	
5	
6	
7	

   (b) Graph the function on the grid below.



25 May 2018 Name: .
Classwork: Periodic functions

2. Simplify the expression $(5-3i)^2$, where i is the imaginary unit.

3. Given i is the imaginary unit, $(1-ai)^2$ in simplest form is what?

4. Write $\sqrt{x^4} \bullet \sqrt{x^3}$ as a single term with a rational exponent.

5. When $b > 0$ and d is a positive integer, the expression $\left(8x^6\right)^{\frac{1}{3}}$ is equivalent to what expressed as a radical?

6. What does $\left(\frac{9x^3}{y^6}\right)^{\frac{1}{2}}$ equal?

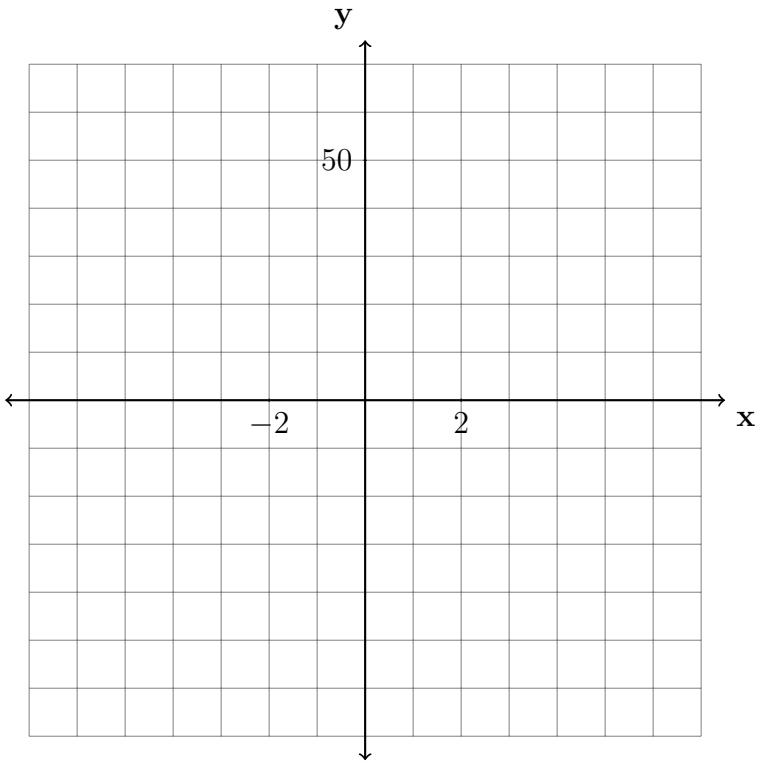
25 May 2018 Name: .
Classwork: Periodic functions

7. What is the inverse of $f(x) = -6(x - 2)$?
   Difficulty=6

8. What is the inverse of $f(x) = \dfrac{x+1}{x-2}$?

9. What are the zeros of the function $f(x) = x^3 - 5x^2 - 4x + 20$?

10. The graph of $y = f(x)$ is shown below. The function has a leading coefficient of 1.



Write an equation for $f(x)$.

The function g is formed by translating function f left 2 units. Write an equation for $g(x)$.

25 May 2018 Name: .
Classwork: Periodic functions

11. If the function $g(x) = ab^x$ represents exponential growth, which statement about $g(x)$ is false?

    (a) $a > 0$ and $b > 1$

    (b) The y-intercept is $(0, a)$.

    (c) The asymptote is $y = 0$.

    (d) The x-intercept is $(b, 0)$

12. A certain pain reliever is taken in 220 mg dosages and has a half-life of 12 hours. The function $A = 220\left(\frac{1}{2}\right)^{\frac{t}{12}}$ can be used to model this situation, where A is the amount of pain reliever in milligrams remaining in the body after t hours.
    According to this function, which statement is true?

    (a) Every hour,the amount of pain reliever remaining is cut in half.

    (b) In 12 hours, there is no pain reliever remaining in the body.

    (c) In 24 hours, there is no pain reliever remaining in the body.

    (d) In 12 hours, 110 mg of pain reliever is remaining.

13. Judith puts \$5000 into an investment account with interest compounded continuously. What is the approximate annual rate is needed for the account to grow to \$9110 after 30 years?