

# Math 18 - Test #1 Info and Review Exercises

Spring 2019, Prof. Beydler

---

## Test Info

---

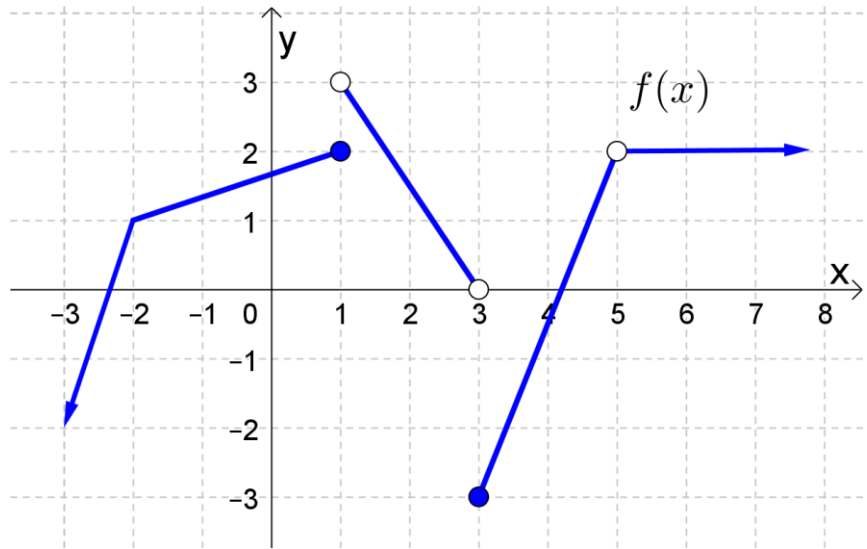
- Will cover worksheets A through D.
- You'll have 1 hour to finish the test.
- This will be a 2-part test. Part 1 will be **no calculator**. Part 2 will be **scientific calculator only**.
- No notes, no books, no phones, no smart watches during the test.
- There will be a seating chart for the test.
- Where to get help as you're studying:
  - Office hours
  - TMARC, LAC, or other tutoring centers
  - E-mail me at [dbeydler@mtsac.edu](mailto:dbeydler@mtsac.edu)

## Review Exercises

**Note:** If you write up the answers to all of the review exercises listed below, and hand them in at the test, you can earn up to 2% extra credit towards your test (depending on neatness and completeness)! It is important to understand that these review exercises are not guaranteed to cover all of the potential problems on the test. Please review the worksheets to fully prepare for the test.

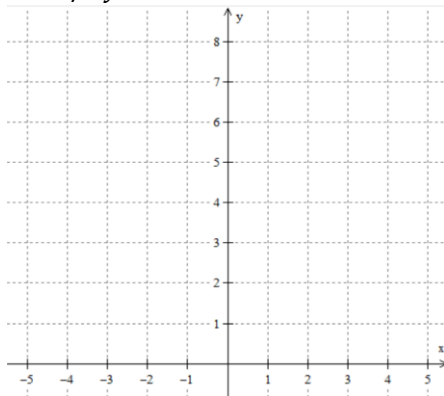
1. Given the graph of  $f(x)$ , find the following.

- a)  $f(-3)$
- b)  $f(-2)$
- c)  $f(1)$
- d)  $f(3)$
- e)  $f(5)$



2. Graph the following functions. Label intercepts and asymptotes. Find the domain and range.

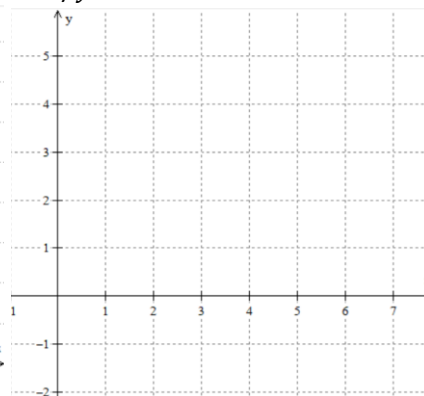
a)  $y = e^x$



Domain:

Range:

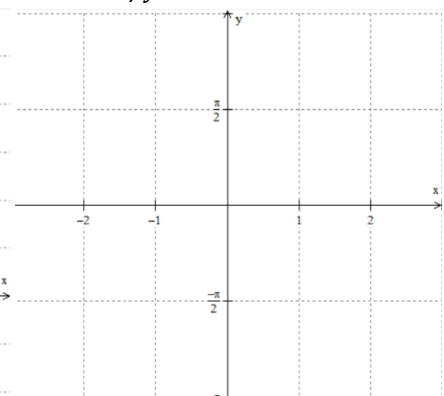
b)  $y = \ln x$



Domain:

Range:

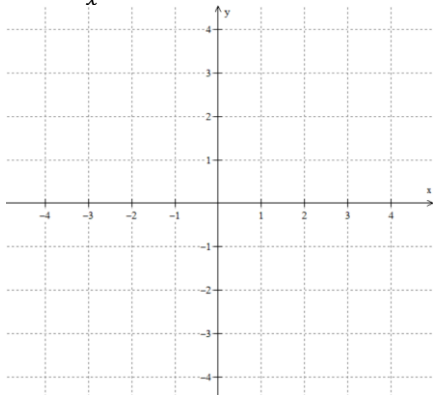
c)  $y = \arctan x$



Domain:

Range:

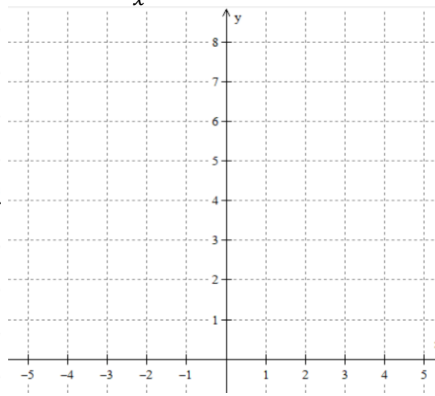
d)  $y = \frac{1}{x}$



Domain:

Range:

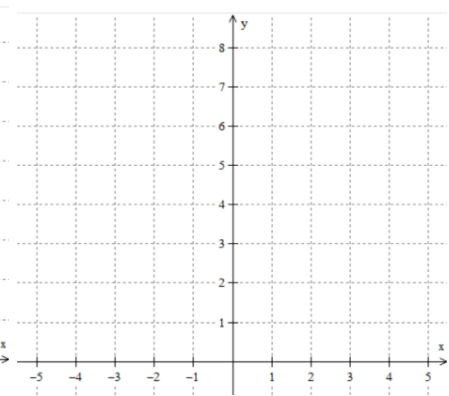
e)  $y = \frac{1}{x^2}$



Domain:

Range:

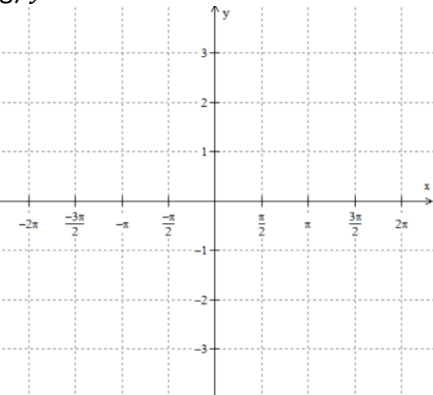
f)  $y = |x|$



Domain:

Range:

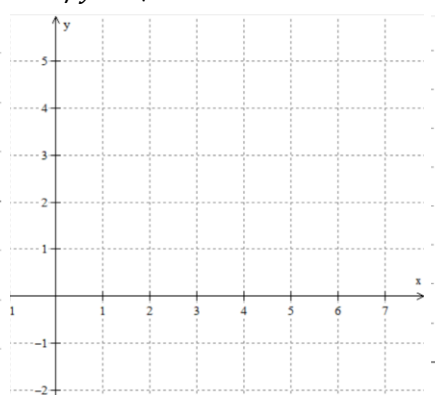
g)  $y = \sin x$



Domain:

Range:

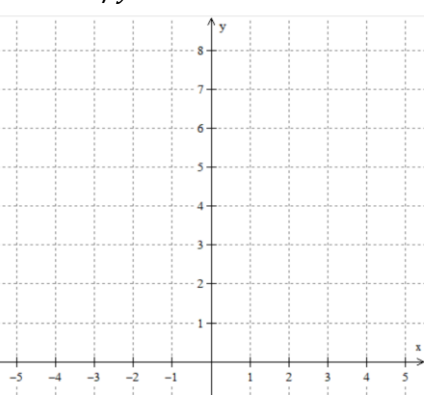
h)  $y = \sqrt{x}$



Domain:

Range:

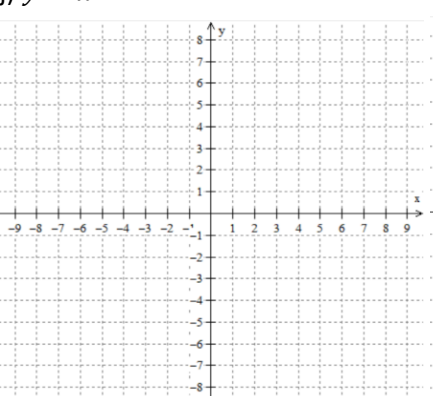
i)  $y = x^2$



Domain:

Range:

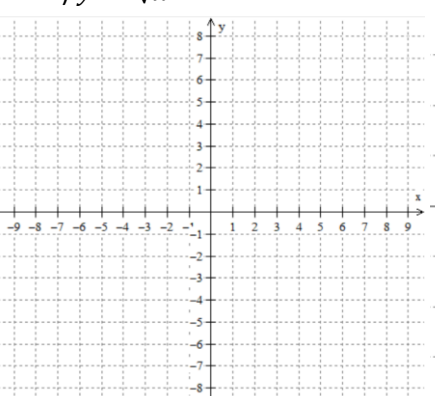
j)  $y = x^3$



Domain:

Range:

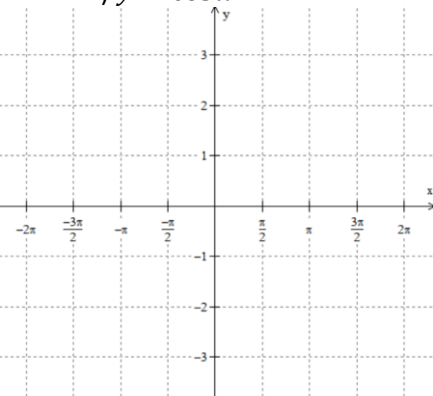
k)  $y = \sqrt[3]{x}$



Domain:

Range:

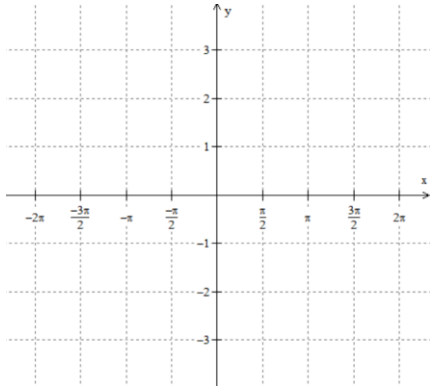
l)  $y = \cos x$



Domain:

Range:

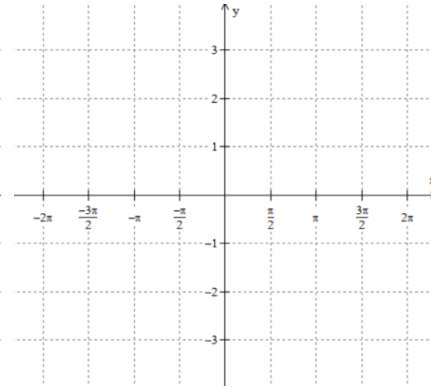
m)  $y = \tan x$



Domain:

Range:

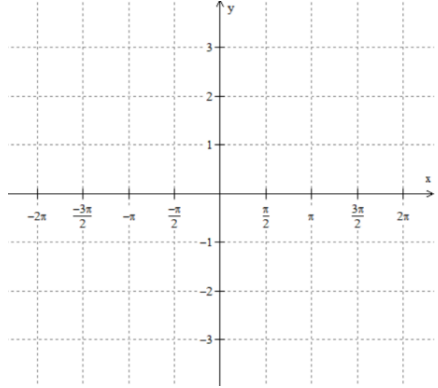
n)  $y = \sec x$



Domain:

Range:

o)  $y = \csc x$

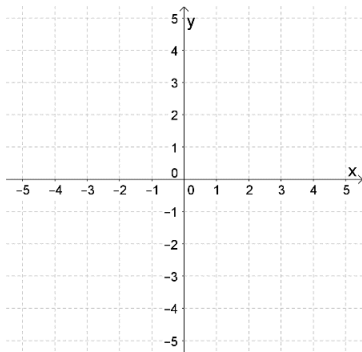


Domain:

Range:

3. Graph each function and find its domain and range.

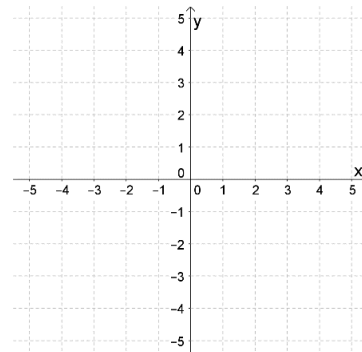
$f(x) = 2|x + 1| - 1$



Domain:

Range:

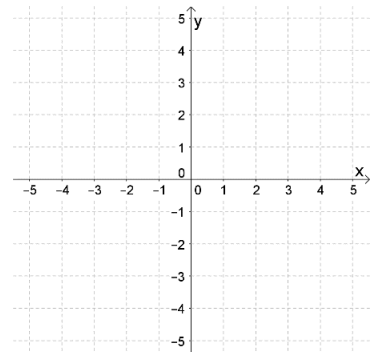
$g(x) = -\sqrt{3 - x}$



Domain:

Range:

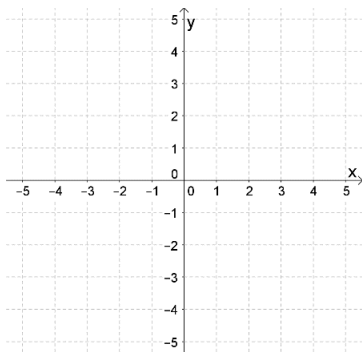
$h(x) = -2 \ln(x + 2)$



Domain:

Range:

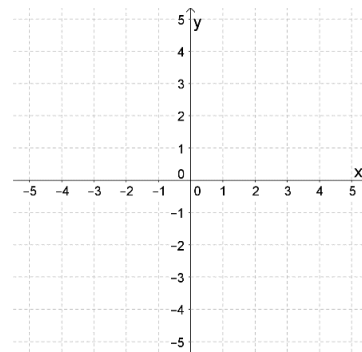
$m(x) = 2 - e^{-x}$



Domain:

Range:

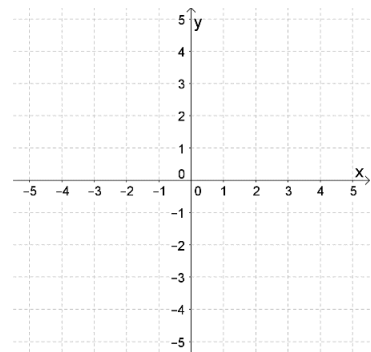
$n(x) = \frac{1}{x-2} + 3$



Domain:

Range:

$q(x) = -\frac{2}{x^2}$



Domain:

Range:

4. Given  $f(x) = \begin{cases} x^2 + 2 & \text{if } x < 1 \\ |x - 3| & \text{if } x \geq 1 \end{cases}$ , find:

- $f(0)$
- $f(1)$
- $f(0.999)$
- $f(1.001)$
- $f(2)$
- Domain of  $f(x)$

5. Find the following function values and then graph each of the following piecewise functions

$$f(x) = \begin{cases} |x + 2|, & x < -1 \\ 2x + 1, & x > -1 \end{cases}$$

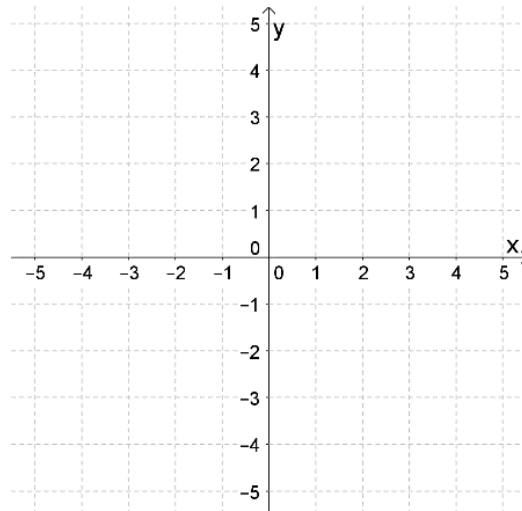
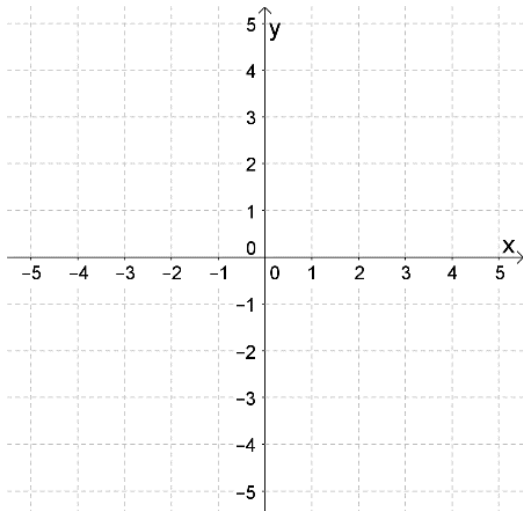
$$g(x) = \begin{cases} \sqrt{-x} + 1, & x < 0 \\ 4, & x = 0 \\ x^2 - 2, & x > 0 \end{cases}$$

$$f(-2) =$$

$$f(0) =$$

$$g(-1) =$$

$$g(0) =$$



6. Answer the following questions.

- What is the term of  $6x - 2x^{3/2} + 7x^2$  with the highest exponent? \_\_\_\_\_
- Rewrite  $\sqrt[5]{x}$  using rational exponents. \_\_\_\_\_
- Rewrite  $\sqrt[4]{x^3}$  using rational exponents. \_\_\_\_\_
- Rewrite  $\sqrt{x^7}$  using rational exponents. \_\_\_\_\_

7. Find the exact value without a calculator.

a)  $\sin \frac{3\pi}{2}$

b)  $\cos \pi$

c)  $\cos \frac{7\pi}{4}$

d)  $\csc \frac{7\pi}{6}$

e)  $\tan \frac{2\pi}{3}$

f)  $\cot \left( -\frac{5\pi}{4} \right)$

8. Find all solutions to the following equations.

a)  $\sqrt{2} \cos x + 3 = 2$

b)  $2 \sin 2x - \sqrt{3} = 0$

c)  $2 \cos 3x - 1 = 0$

9. Solve the following equations.

a)  $1 - \log_3 x = 3$

b)  $7 = 3 + 2 \ln(2x - 1)$

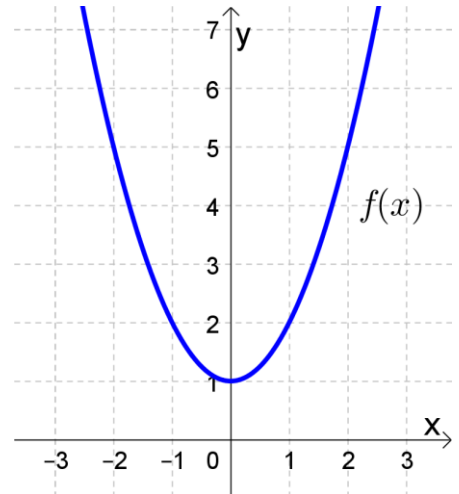
10. Find the equation of the line in **slope-intercept form** through the following points.

a)  $(-2, 1)$  and  $(3, -5)$

b)  $(-1, -4)$  and  $(-2, 0)$

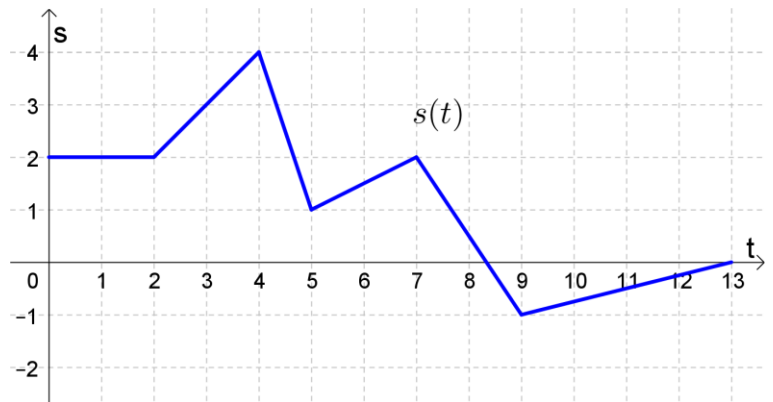
11. The graph of  $f(x)$  is shown to the right.

- a) Use the graph to determine the average rate of change of  $f(x)$  between  $x = 0$  and  $x = 2$ .
- b) Use the graph to determine the average rate of change of  $f(x)$  between  $x = -2$  and  $x = 2$ .



12. The position of a particle  $s(t)$  (in meters) is shown to the right as a function of  $t$  (in seconds). Find the average velocity of the particle over the following time intervals. Be sure to write the units of your answers.

- a)  $t = 0$  to  $t = 2$
- b)  $t = 2$  to  $t = 4$
- c)  $t = 4$  to  $t = 5$
- d)  $t = 7$  to  $t = 9$
- e)  $t = 0$  to  $t = 13$





13. Below is a table that shows average test scores given the number of hours of sleep the night before the test.

Hours of sleep	Average test score
5	60%
6	64%
7	72%
8	83%
9	85%
10	73%

Source: I made it up!

- a) Find the average rate of change of the average test scores as the hours of sleep go from 5 to 6. Write out your calculation and give units for your answer.
- b) Find the average rate of change of the average test scores as the hours of sleep go from 8 to 10. Write out your calculation and give units for your answer.

14. Find the average rate of change of  $f(x) = \frac{1}{x-1}$  between  $x = 2$  and  $x = 4$ .

15. Find the difference quotient  $\frac{f(x+h)-f(x)}{h}$  of  $f(x) = -x^3 + 2x$  and simplify by canceling the factor of  $h$ .

16. Find the difference quotient  $\frac{f(x+h)-f(x)}{h}$  of  $f(x) = \frac{2}{x+1}$  and simplify by canceling the factor of  $h$ .

17. Find the difference quotient  $\frac{f(x+h)-f(x)}{h}$  of  $f(x) = -\sqrt{x+1}$  and simplify by canceling the factor of  $h$ .