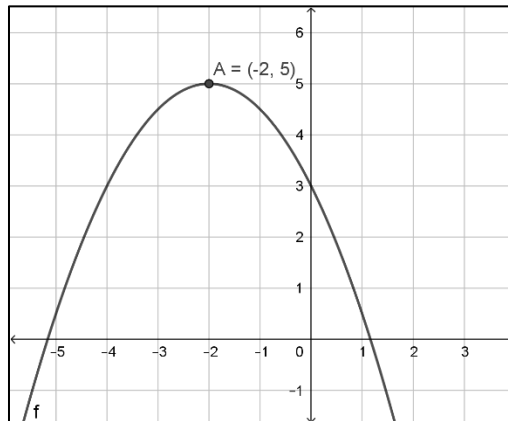


WSU CE Math 1010 REAL Final Review

Read each question carefully and show all your work to receive full credit for your answers. The use of a scientific calculator is allowed.

1. Simplify by performing the indicated operation: $(4 + 8i)(8 + i)$.
2. Identify the domain and range of the function $f(x) = \log_3(3x - 6)$.
 - a. Domain: $x > 2$; Range: All real numbers
 - b. Domain: $x \geq 0$; Range: $y > 2$
 - c. Domain: $x \geq 2$; Range: All real numbers
 - d. Domain: $x \geq 2$; Range: $y > 0$
3. Write the equation of the line passing through the points $(-2, 5)$ and $(1, -1)$
4. Identify the x-interval(s) over which the function is increasing.

- a. $(-\infty, 5)$
- b. $(-\infty, -2)$
- c. $(-2, \infty)$
- d. $(-\infty, \infty)$



5. Two of the following expressions simplify to 6. Circle them.
 - a. $\log_2 64$
 - b. $\frac{x+6}{x+1}$
 - c. $\frac{6x^2+6}{x^2+1}$
 - d. $\left(\frac{1}{2}\right)^{-3}$
6. Evaluate each expression:
 - a. $\log_{49} \left(\frac{1}{7}\right)$
 - b. $\ln e$
 - c. $\log_4(4^3)$

7. The notation $f(p)$ represents the cost to fill up your car with gasoline depending on the price of a gallon of gasoline. Interpret the meaning of $f(2.59)$. Which statement is most correct?
- The cost of a gallon of gasoline
 - The number of gallons to fill up the car
 - The cost to fill up the car
 - The cost to fill up the car when gasoline is \$2.59 per gallon
8. You know the point $(-2, 7)$ is on the graph of a *function* f . Choose the coordinates of a point you know is **not** on the graph of the function.
- $(-2, 9)$
 - $(0, 3)$
 - $(7, 0)$
 - $(9, 7)$
9. Given $f(x) = x^2 + 3x + 2$ and $g(x) = \sqrt{4 - x}$, find $f(g(-5))$.
- 3
 - 20
 - 12
 - 36
 - none of the above
10. Determine which data set is **exponential**. Circle the correct answer

A	
x	y
-2	6.6
-1	5.8
0	5
1	4.2
2	3.4

B	
x	y
-3	11
-1	3
0	2
1	3
3	11

C	
x	y
-1	0.65
0	1.3
1	2.6
2	5.2
3	10.4

D	
x	y
-3	
0	
1	0
3	1
9	2

11. Write the expression in radical form $(3xy^2)^{\frac{2}{5}}$

12. Simplify the radical expression $\sqrt[3]{81xy^3z^5}$

13. Solve: $(4 - x)^{\frac{1}{3}} - 2 = 3$

14. Factor the following into prime factors.

- $25 - 4y^2$
- $x^3 + 27b^3$
- $6y^3 - 4y^2 - 2y$

15. Find the LCD for the given rational expressions.

a. $\frac{4}{y^2-3y+2}, \frac{6}{y^2-1}$

b. $\frac{5}{7-z}, \frac{6}{z-7}$

16. Given the LCD for the expressions $\frac{6}{x+4}$ and $\frac{1}{x}$ is $x^2 + 4x$, simplify the following: $\frac{6}{x+4} + \frac{1}{x}$

17. Simplify: $\frac{3}{5r} \div \frac{9}{rs}$

18. Simplify: $\frac{r+8}{r^2+12r+32} \div \frac{1}{r^2+5r+4}$

19. Simplify: $\frac{5}{2b} - \frac{b+4}{2b^2-2b}$

20. Simplify: $\frac{\frac{x^2}{3} - \frac{2}{9}}{x+3} \div \frac{2x}{2+3}$

21. Simplify the expression such that there are no negative exponents:

$$\left(\frac{2x^{-3}y^0}{z^4}\right) \left(\frac{3x^{-2}z^7}{y^{-2}}\right)$$

22. Your parents purchase a townhome for you and your siblings to live in while attending college. They are planning to sell it after 15 years when everyone is through college. The value of the townhome can be modeled by the function $V(t) = 125,240(1.05)^t$ where V is the value of the townhome in dollars after t years of ownership.

a. What is the purchase price of the townhome?

b. What is the growth factor?

c. What is the growth rate?

d. What does the growth rate represent in the context of this problem? Please write a sentence.

e. What will the value of the townhome be in 4 years when you graduate? Round to the nearest dollar.

f. What is the practical domain? (Write your answer either as an inequality or in interval notation.)

g. What is the practical range? (Write your answer either as an inequality or in interval notation.)

23. What are the zeros of the function $f(x) = x^2 + 2x + 5$?

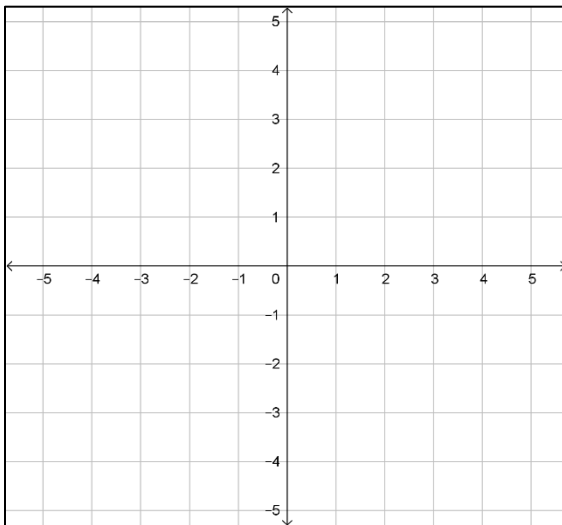
24. How many x-intercepts does the function $f(x) = x^2 + 4x + 4$ have?

- a. 0 x-intercepts
- b. 1 x-intercept
- c. 2 x-intercepts
- d. cannot tell how many x-intercepts the function has

25. Identify the following for the given function $f(x) = 2x^2 + 4x + 10$. **Write your answers as ordered pairs.**

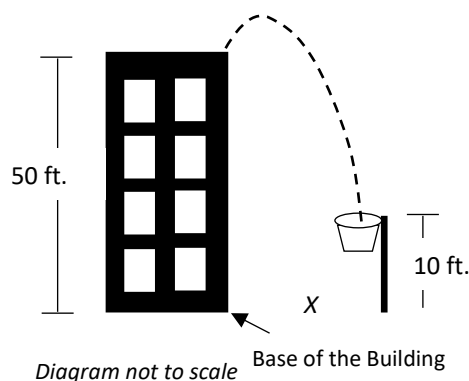
- a. Coordinates of the vertex
- b. y-intercept

26. Draw a complete and accurate graph of the function $g(x) = x^2 + 2x - 3$. Include at least three points on your graph, including the vertex.



27. The cost to manufacture lawn mowers for a local business can be modeled by the function $C(x) = 2x^2 - 120x + 2000$, where x is the number of lawn mowers manufactured in a month and C is the cost per lawn mower. Interpret the meaning of the vertex which is at: $(30, 200)$

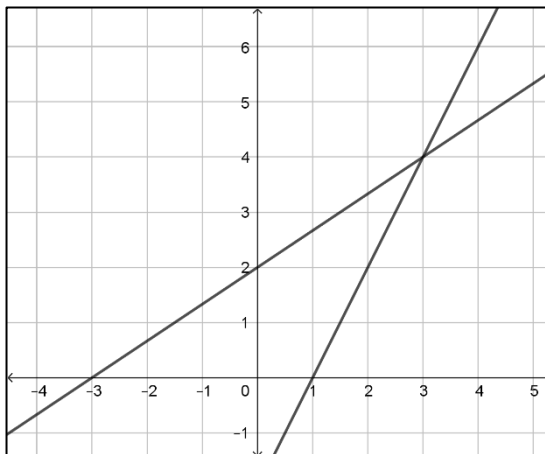
28. You decide you want to make your own video of a trick basketball shot to post on YouTube. You have a portable basketball hoop that is 10 feet high. You talk to the building manager into letting you shoot the ball off the edge of the roof of his building. At the point you release the ball it will be 50 feet high. After doing some calculations you find the path the ball will travel when you shoot it can be modeled by the equation $y = -\frac{1}{4}x^2 + 4x + 50$ where x measures the horizontal distance the ball has traveled and y measures the corresponding height. Please see the diagram below.
- How far from the building should you place the center of your basketball hoop for the ball to go into the hoop? Please your to the nearest tenth
 - How high is the basketball at its highest point?



29. Find the inverse of $g(x) = \frac{x+5}{4}$. Be sure to label the final function appropriately.

30. The graphs for the system of equations are below. Identify the solution to the system:

$$\begin{cases} y = 2x - 2 \\ 4x - 6y = -12 \end{cases}$$



31. Solve the system $y = 3x - 1$ and $4x - 3y = -7$ using substitution. (Be prepared to solve using either substitution or elimination as requested on the final exam.)

32. The surface area of a balloon is given by $S(r) = 4\pi r^2$, where r is the radius of the balloon in inches. The radius is increasing with time, t in seconds, as the balloon is being blown up according to the function $r(t) = \frac{4}{5}t^3$, where $t > 0$. Find the surface area, S , as a function of time, t .

33. Solve: $\frac{4}{p+2} = \frac{1}{p^2+2p} + \frac{1}{p}$

34. Rationalize the denominator: $\frac{-2\sqrt{7}+5\sqrt{2}}{\sqrt{3r}}$

35. Use the function $g(x) = \log_2 x$ to create table of three points for $g(x)$ and its inverse.

Function	
x	y

Inverse	
x	y

36. Using the function $y = g(x)$ is graphed below. Graph $y = g(x + 1) - 2$ on the blank axis. Be sure to label the points A', B' and C' with their coordinates the new graph.

