

Module 1

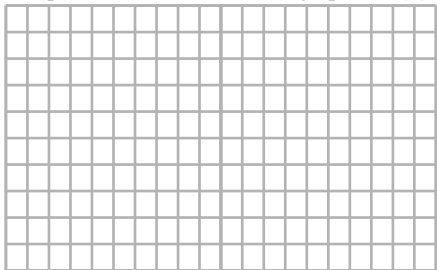
1. Given $f(x)$ and $f^{-1}(x)$. What do we know about:

A. The table of values: _____

B. Their graphs: _____

C. $f(f^{-1}(x))$: _____

2. Graph $f(x) = 2x - 3$. Then graph $f^{-1}(x)$



3. Which selection below is the inverse of $f(x) = (x - 3)^2$?

$g(x) = \sqrt{x} + 3$ or $h(x) = \sqrt{x + 3}$

Justify your answer using words, tables, graphs or algebra: _____

4. If $f(x) = 2(x - 5)$ and $h(x) = \frac{x+5}{2}$

Is $h(x)$ an inverse of $f(x)$? YES NO

Justify your answer using words, tables, graphs or algebra: _____

5. Given $(x) = \log_3 x$; What is $f^{-1}(x)$?

Solve for x:

6. $\sqrt[3]{x + 1} = 3$

7. $3x^2 + 7x - 5 = 2x^2 + x + 7$

8. Simplify: $(\frac{3^{-2}}{3^3})$

9. Given $f(x) = x^2 - 4$ and $g(x) = 3x + 1$

Find

a. $f(x) - g(x)$

b. $f(x) + g(x)$

c. $f(x) \cdot g(x)$

d. $f(g(x))$

Module 2

SOLVE FOR X:

1. $10^{x-3} = 100^{4x-5}$

2. $\log(5-3x) = \log(4x-9)$

3. $10^{2x} + 3 = 8$

4. $-5^{-x} + 9 = 6$

5. $\log_5(2x+15) = \log_5 3x$

6. $4\log_3 x = 28$

7. $10^{2x-3} + 4 = 21$

8. $\log 2x = 2$

9. $4\log x = 4$

10. $\log(3x-2) = 3$

Evaluate the following expressions.

11. $\log_5 125$

12. $\log_7 343$

13. $\log_8 1$

14. $\log_{12} 12$

15. $\log_6 36$

16. $\log_2 \frac{1}{2}$

17. $\log_3 \frac{1}{27}$

18. $\log_{\frac{1}{5}} 25$

19. $\log 1$

20. $\log_{11} 121$

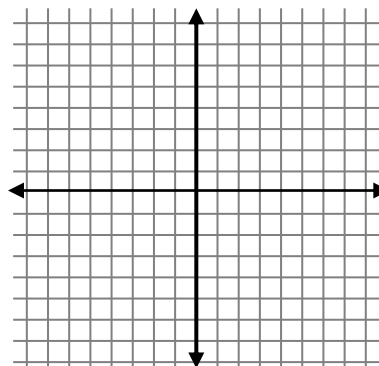
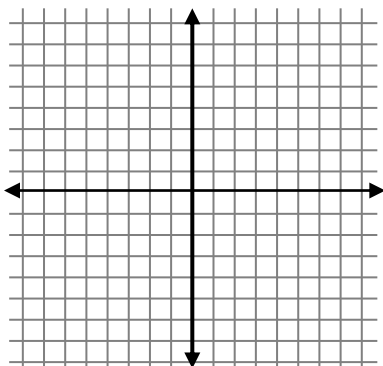
21. $\log_9 9$

22. $\log 0.01$

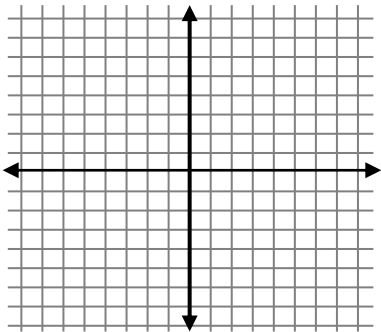
GRAPH:

23. $y = -2 + \log_2(x+1)$

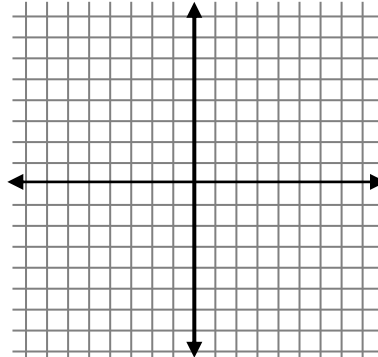
24. $y = 3 + \log_2(x-4)$



25. $y = 2^{x+1}$



26. $y = 2 + 2^{x-4}$



Expand the following expressions

27. $\log_6 \frac{10}{3}$

28. $\log 6x^3yz^2$

29. $\log_4 \frac{4}{3}$

30. Given: $\log_a 3 = 2.53$ and $\log_a 4 = 3.12$ find:

a) $\log_a 12$

b) $\log_a 16$

c) $\log_a 36$

31. Solve $\log_4(x - 2) = \log_4(2x + 4)$

Module 3

Find the zeros of the function:

1) $f(x) = (2x - 1)(x - 5)$

2) $f(x) = (x - 3)(3x + 1)(x + 1)$

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

4) $f(x) = x(5x - 2)(x^2 + 1)$

5) $f(x) = x(x + 2)(x - 2)(3x^2 - 4)$

6) $f(x) = (2x - 1)(x^2 + 3)(2x^2 - 5)$

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

8) $f(x) = (2x + 5)(x^2 - 2x - 5)$

Write a polynomial function of least degree with integral coefficients that has the given zeros.

9) 3, 2, -2

10) 3, 1, -2, -4

11) 5, 3, 1, -1

12) 2, 5, 3, -5

Find ALL zeros by factoring each function.

13) $f(x) = x^3 - 2x^2 + x$

14) $f(x) = x^3 + 8$

15) $f(x) = x^4 - x^2 - 30$

16) $f(x) = x^4 - 64$

17) $f(x) = x^6 + 2x^3 + 1$

Sketch a polynomial function which satisfies the given conditions.

18) Degree = 3; zeros are 0 (multiplicity 1) and 3 (multiplicity 2)

19) Degree = 4; zeros are 1, -6, and 4 (multiplicity 2)

20) Degree = 4; zero = 2 (multiplicity 4); opens downward

21) Degree = 5; only real zero is -4 (multiplicity 1); leading coefficient is negative

22) Degree = 6; has zeros of 2 (multiplicity 3) and -4 (multiplicity 3); leading coefficient is negative

Find the zeros of the polynomial function and sketch a graph:

23) $f(x) = 2x^3 - 3x^2$

24) $f(x) = x^4 + x^3 - 4x^2 - 4x$

Factor each and find all zeros. One factor has been given. Use synthetic or long division.

25) $f(x) = x^3 + 9x^2 + 23x + 15$; $x + 5$

26) $f(x) = x^3 - x^2 - 14x + 24$; $x - 2$

27) $f(x) = x^4 + 3x^3 - 13x^2 - 15x$; $x + 1$

28) $f(x) = x^3 + 2x^2 - 23x - 60$; $x + 4$

29) $f(x) = 6x^3 + 7x^2 - 1$; $2x + 1$

Probability and Statistics Unit

1. For the following grades on a test, 50, 55, 60, 58, 62, 57, 68, 51, 63, 60, 59, 62, 25, 55, 60, 52, find the following:

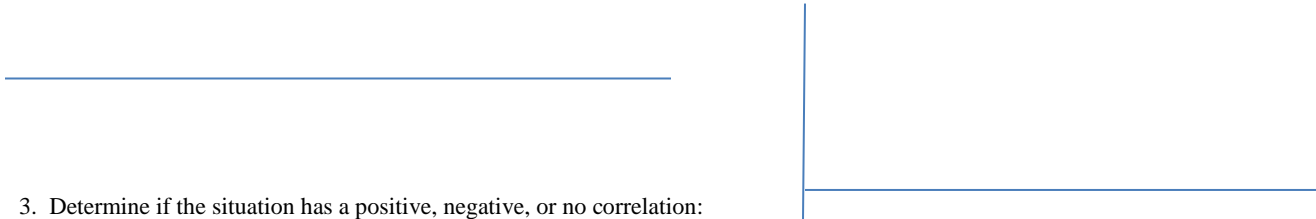
Mean: Median: Mode: Q1:

Q3: Minimum: Maximum:

2. Construct a) boxplot and b) histogram (use intervals 50-52, 53-55, etc for histogram)

a). boxplot

b). histogram



3. Determine if the situation has a positive, negative, or no correlation:

- Practicing free throws vs. Free Throw percentage
- More running vs. body weight
- Make a scatterplot for the data below.

Hours Study	2	3	4	5	6	7
Test Score	68	72	85	83	90	93

4. The Regression equation: $\hat{y} = 5.057x + 59.076$. Is this model a good fit for the data? Predict the test score for 4.5 hours of study.

5. Complete the table to answer the following questions.

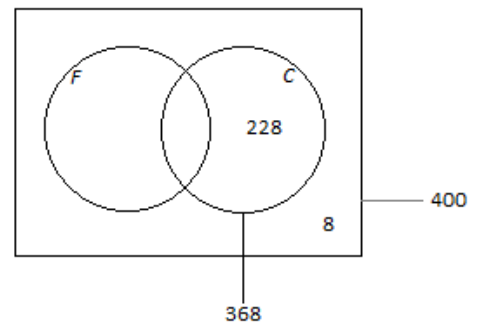
	Football	Basketball	Soccer	Total
Males	48	35	17	
Females	22	38	40	
Total				

- What is the probability that a randomly chosen female likes soccer?
- What is the probability that someone likes basketball?
- Given that a person likes football, what is the probability they are male?

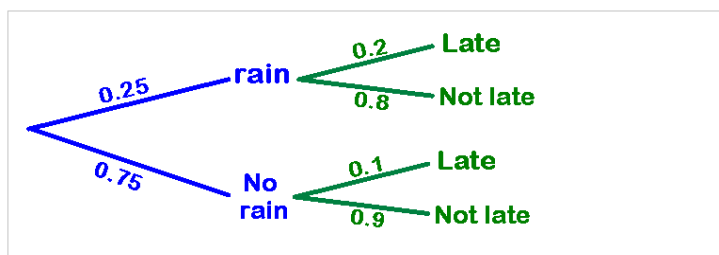
6. There are **400** people on the flight, **368** have checked baggage, **228** have checked baggage but do not have frequent-flier status, and **8** have neither frequent-flier status nor checked baggage.

a. Using a Venn diagram, calculate the following:

- The number of people on the flight who have frequent-flier status and have checked baggage
- The total number of people on the flight who have frequent-flier status



7. There is a 25% chance that it will rain tomorrow. When it does rain, Jodie has a 20% chance of being late to school. When it does not rain, she has only a 10% of being late to school. The tree diagram below shows the representation of this situation. Find the probability that it does rain and Jodie is not late to school.



Advanced Math 3 Additional Review:

1. You deposit \$1600 in a bank account. Find the balance after 10 years for each of the following situations.

- The account pays 2.5% annual interest compounded monthly.
- The account pays 1.75% annual interest compounded quarterly.
- The account pays 1.5% annual interest compounded continuously

2. The number of bacteria in a certain culture increases by 10% continuously until available space is depleted.

Only 100 bacteria are present to start the growth.

a) Write an equation that models the growth of the bacteria when the space is unlimited.

b) How long will it take to have 550 bacteria?

3. Solve for x : $\log(x + 2) - \log 5 = \log(x + 2) - \log x$

4. Solve for a : $\ln(x - 10) = 6$

5. Solve for x : $x^2 - 4x = \log_2 32$

6. Solve: $\sqrt[6]{3x + 1} = 2$

7. Solve: $7x^2 + 3x - 14 = 6x^2 - 6x + 8$

8. For the following two functions, find $g(f(x))$. $f(x) = 4x - 1$ $g(x) = 2x^2 - 3x + 8$