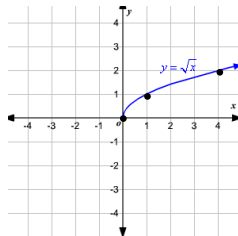
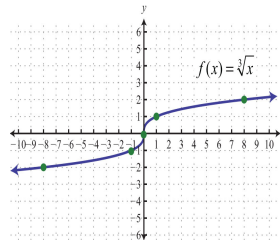


## Ch. 7 Notes - WB pg 67-68

$$y = \sqrt{x} \quad (0,0) (1,1) (4,2)$$



$$y = \sqrt[3]{x} \quad (0,0) (1,1) (-1,-1)$$



To find the INVERSE,  
switch x and y,  
then solve for y.

Ex.  $y = x^2 + 5$

**Inverse:**  $x = y^2 + 5$

**so**  $y = \pm\sqrt{x-5}$

Example:  $(f \circ g)(x)$  is the same as  $f(g(x))$

$$f(x) = 3x - 5 \quad g(x) = x^2 + 2$$

Find:  $f(g(3))$

$$g(3) = 11$$

$$f(11) = 28$$

Know domain and range  
of square root and cube  
root functions.

## Chapter 7

1.  $x^2+5/x-7$ ; all real #'s except 7
2.  $x^2-2x+19$ ; all real #'s
3.  $x^3-7x^2+5x-35$ ; all real #'s
4.  $3x^2+8$ ;  $9x^2+30x+26$
5.  $4x^2-10x+2$ ;  $2x^2-10x+4$
6.  $\sqrt{10x+5}$ ;  $5\sqrt{2x-1}+3$
7.  $-2x^2-16x-32$ ;  $-2x^2+4$
8.  $y = \sqrt{9(x-7)} + 4$
9.  $y = \sqrt[3]{8(x-8)} - 5$
10.  $y = \sqrt[3]{-27(x+1)} + 4$
11.  $y = \sqrt{16(x-2)}$
12. Domain:  $[1, \infty)$ ; Range:  $[2, \infty)$
13. Domain:  $[-3, \infty)$ ; Range:  $[-1, \infty)$
14. Domain:  $[0, \infty)$ ; Range:  $[3, \infty)$
15. Domain:  $[-4, \infty)$ ; Range:  $(-\infty, -1]$
16. 80
17. 11
18. 15
19. 21
20. -9
21. -1
22.  $f^{-1}(x) = \pm\sqrt{x+4} - 2$  not a function
23.  $f^{-1}(x) = \sqrt[3]{\frac{x+1}{4}}$  function
24.  $f^{-1}(x) = x^2 - 4$  function
25.  $f^{-1}(x) = \frac{1}{3}(x-2)$  function
26.  $f^{-1}(x) = \pm\sqrt{x-5}$  not a function
27.  $f^{-1}(x) = x^3 - 2$  function
- 28a. 360      b. 360
29. Answers vary

## Ch 8 Notes - WB pg 78

$$\log_a(x \cdot z) = \log_a x + \log_a z$$

$$\log_a \frac{x}{z} = \log_a x - \log_a z$$

$$\log_a x^r = r \cdot \log_a x; \quad \log_a a^r = r$$

$$\log_a a = 1; \quad \log_a 1 = 0$$

Exponential Form

$$5^2 = 25$$

Growth Equation

$$y = a(1 + r)^t$$

Log Form

$$\log_5 25 = 2$$

Decay Equation

$$y = a(1 - r)^t$$

r = percent rate but written as a decimal  
for example: 3.2% = .032

t = time

a = initial amount

y = final amount

Compounded Continuously Equation  $A = Pe^{rt}$ 

**Exponentials**  $e^x = \exp(x)$   
 $b^x = b^y \rightarrow x = y$  ( $b > 0$  and  $b \neq 1$ )  
 If the bases are the same, set the exponents equal and solve.

**Solving exponential equations:**

1. Isolate exponential expression.
2. Take *log* or *ln* of both sides.
3. Solve for the variable.

$\ln(x)$  and  $e^x$  are inverse functions

$$\ln e^x = x \quad e^{\ln x} = x$$

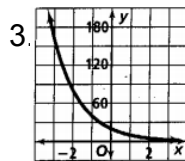
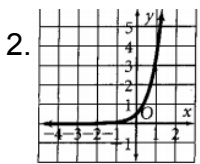
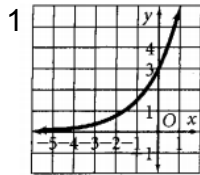
$$\ln e = 1 \quad e^{\ln 4} = 4$$

$$e^{2 \ln 3} = e^{\ln 3^2} = 9$$

*ln* has an implied base of e

*log* has an implied base of 10

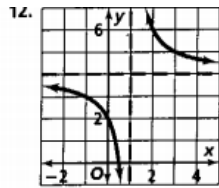
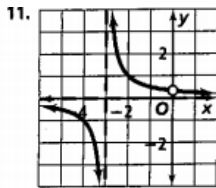
Chapter 8: Form A



- 4. Answers may vary
- 5. 98% Decay
- 6. 130% Growth
- 7. 25% Growth
- 8. \$2754.26
- 9. The graph of  $y = -2^x + 1$  is the graph of  $y = 2^x$  reflected across the x-axis and shifted up 1 unit
- 10. The graph of  $y = 3^{x-4}$  is the graph of  $y = 3^x$  shifted right 4 units
- 11. The graph of  $y = 5^{x+1} - 2$  is the graph of  $y = 5^x$  shifted left 1 unit and down 2 units.
- 12. 3
- 13. 2
- 14. 6
- 15.  $-1/2$
- 16.  $-2$
- 17.  $-8/3$
- 18-20 on next page
- 21.  $\log_7 343 = 3$
- 22.  $\log_{2/3} 27/8 = -3$
- 23.  $\log_2 0.0625 = -4$
- 24.  $\log 2$
- 25.  $\log 1/b$
- 26.  $2 \log y - \log z$
- 27.  $\log_5 6 + \log_5 x$
- 28.  $2 \log y - \log z$
- 29.  $2 \log_5 x + \log_5 y - 4 \log_5 x$
- 30.  $\ln 20$
- 31.  $\ln a^5 b^3$
- 32.  $\ln \frac{z^2}{\sqrt{xy^3}}$
- 33. 1
- 34. 2
- 35. 2
- 36. 2
- 37. 2
- 38. 8
- 39. Answers vary  
ex.  $y = -2^x$
- 40. 200
- 41. 1.26
- 42. .801
- 43. 5.72
- 44. 13.86
- 45. 741.6
- 46.  $\log_4 12 / \log 4$
- 47.  $\log 5 / \log 2$
- 48.  $\log 14 / \log 8$
- 49. 5.72
- 50. 4.71
- 51. 2.24
- 52.  $1/8$  or  $0.13$
- 53. 20.17
- 54. 11.52
- 55. 1.47
- 56. Answers vary

## Chapter 9: Form B

1.  $y = \frac{4}{x+2} - 1$       2.  $y = \frac{4}{x-3} + 2$

3. vertical asymptote,  $x = -4$ ;horizontal asymptote,  $y = 2$ 4. VA  $x = -9$ , HA  $y = 0$ , hole  $x = 4$ 5. VA  $x = 4$ ,  $x = -4$ , HA  $y = 0$ 6. VA  $x = -2$ , HA  $y = 3$ 9.  $-x/2$ ;  $x \neq 7$ 10.  $8/3$ ;  $x \neq 7$  or  $5$ 

11.  $x^2 + 7x - 12 / (x+4)(x-4)$

12.  $7x - 3 / 2(x+3)(x-3)$

13. 1

14.  $2xy - y / 3xy + x$

15.  $3(x + 5)(x - 5)$

16.  $8(x + 6)^2(x - 3)$

17.  $\frac{x^2 + 7x - 12}{(x+4)(x-4)}$

18.  $\frac{7x - 3}{2(x+3)(x-3)}$

19.  $\frac{2(6 - 4x)}{(x+3)}$

20.  $\frac{2y(2-x)}{5x^2}$

21. 1

22. -2, 6

23. 0



24. 4

## Stats Topics - WB pg 108-111

Using Percents to Solve Problems  $\frac{\text{percent}}{100} = \frac{\text{part}}{\text{whole}}$

Percent of Change  $\frac{|\text{New Value} - \text{Old Value}|}{\text{Old Value}} \times 100$

Finding Lin Reg and Standard Deviation with a calculator

Samples - Sample Proportion,  $\pm \frac{1}{\sqrt{n}}$   
 Margin of Error,    
 Interval containing population proportion

Dimensional Analysis

example: change 65 mi/hr to ft/sec

Permutations and Combinations

## Probability and Stats Review - Spring Final Exam - NON CALCULATOR

1) 9.8

2) 9

3) D

4)  $\frac{4}{7}$

5) 1

6)  $\frac{2}{7}$

7) 0

8)  $\frac{13}{58}$

9)  $\frac{40}{62} = \frac{20}{31}$

10)  $\frac{32}{120} = \frac{4}{15}$

11)  $\frac{22}{32} = \frac{11}{16}$

12)  $\frac{10}{120} = \frac{1}{12}$

13a) 252 13b)  $\frac{1}{45}$

14) 60 ways, permutation

15) P

16) C

17) all biased but option c

## Probability and Stats Review - Spring Final Exam - CALCULATOR

18) 1952

19) 62.6%

20) C

21) \$131.74

22) 16.3% 816

23) D.

24) 4.47 mi/hr

25) 149.6 ft/sec

26)  $\pm 4\%$  ; 74% - 82%

27) 1111

28) Mean = 8.06

Med = 8

Mode = 11

SD = 4.01

29) Mean = 46.94

Med = 47.35

Mode = none

SD = 3.24

30a) Quadratic Model:  $y = -.01x^2 + 0.75x + 13.47$ 

30b) 27.33 gas mileage

31) 1287

32) 85,140



# Trig Notes - WB pg 100

## Algebra II Trigonometry Survival Guide

**START HERE!** → Think about what type of question it is.

**ARC LENGTH equals Radians Times Radius**

**An Equation** with Sin, Cos or Tan in it which will look like either....

**A Diagram** of a Right Angled Triangle where you are asked to work out the value of an unknown letter/symbol.

**A Worded Question**

Find the angles in degrees for:  
 $\sin \theta = \frac{1}{2}$   
 $\theta = 30^\circ$  or  $150^\circ$

Find the angles in radians for:  
 $\cos \theta = \frac{-1}{\sqrt{2}}$   
 $\theta = \frac{3\pi}{4}$ ,  $\frac{5\pi}{4}$

Other concepts to know  
 Coterminal Angles  
 Reciprocal Functions Csc, Sec, Cot  
 Angles in Standard Position

MEMORIZE YOUR FLASHCARDS or the TRIANGLES BELOW

Label the sides of the right angled triangle in relation to the angle.  
 Use:  
 H - Hypotenuse  
 O - Opposite  
 A - Adjacent

Write the appropriate equation with the values at this stage:  
 $\sin \theta = \frac{O}{H}$     $\cos \theta = \frac{A}{H}$     $\tan \theta = \frac{O}{A}$

If it's not a right triangle, you must use **LAW OF SINES** or **LAW OF COSINES**.

Remember that **angle of depression** is the angle going down from the viewer.

Remember that **angle of elevation** is the angle going up from the viewer.

**REMEMBER**  
 Quadrant II: Sine, cosine  
 Quadrant I: All  
 Quadrant III: Tangent, cotangent  
 Quadrant IV: Cosine, secant

FORMULAS TO KNOW TO CONVERT:  
 Radians to Degrees: Multiply by  $\frac{180^\circ}{\pi}$   
 Degrees to Radians: Multiply by  $\frac{\pi}{180^\circ}$

Be sure to include any units of measurement like km, m, cm, mm, or degrees.

To find the angle on your calculator, use the **INVERSE**.

**Law of Sines**  
 $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$

**Law of Cosines**  
 $a^2 = b^2 + c^2 - 2bc \cos A$   
 $b^2 = a^2 + c^2 - 2ac \cos B$   
 $c^2 = a^2 + b^2 - 2ab \cos C$

**Triangle Area**  
 $A = \frac{1}{2} ab \sin C$

## Trig Review

$$1. \begin{aligned} \cos 210^\circ &= -\frac{\sqrt{3}}{2} \\ \sin 210^\circ &= -\frac{1}{2} \\ \tan 210^\circ &= \frac{1}{\sqrt{3}} \end{aligned}$$

$$2. \begin{aligned} \cos 135^\circ &= -\frac{1}{\sqrt{2}} \\ \sin 135^\circ &= \frac{1}{\sqrt{2}} \\ \tan 135^\circ &= -1 \end{aligned}$$

$$3. \begin{aligned} \cos \frac{5\pi}{3} &= \frac{1}{2} \\ \sin \frac{5\pi}{3} &= -\frac{\sqrt{3}}{2} \\ \tan \frac{5\pi}{3} &= -\sqrt{3} \end{aligned}$$

$$4. \begin{aligned} \cos \frac{\pi}{6} &= \frac{\sqrt{3}}{2} \\ \sin \frac{\pi}{6} &= \frac{1}{2} \\ \tan \frac{\pi}{6} &= \frac{1}{\sqrt{3}} \end{aligned}$$

5.  $\frac{7\pi}{4}$

6.  $150^\circ$

7.  $135^\circ$

8.  $\frac{20\pi}{9}$

9.  $20^\circ$

10.  $\frac{3\pi}{2}$

11.  $240^\circ$

12.  $\frac{3\pi}{4}$

13. II

14. III

15. III

16. IV

17.  $258^\circ, -462^\circ$

18.  $73^\circ, -287^\circ$

19.  $\frac{20\pi}{9} - \frac{16\pi}{9}$

20.  $\frac{9\pi}{4} - \frac{7\pi}{4}$

21.  $\frac{1}{\sqrt{2}}$

22.  $-\frac{\sqrt{3}}{2}$

23.  $-\sqrt{3}$

24.  $-\frac{1}{\sqrt{2}}$

25.  $\frac{12}{13}$

26.  $\frac{13}{12}$

27.  $\frac{13}{5}$

28.  $\frac{5}{12}$

29.  $\frac{4}{5}$

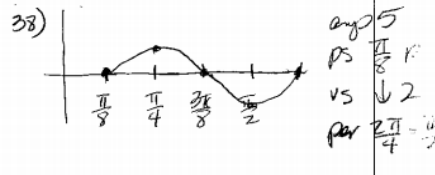
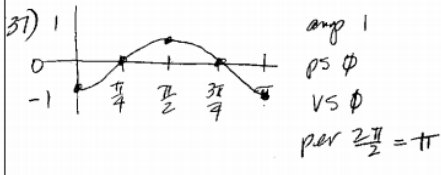
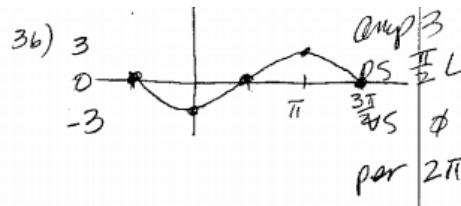
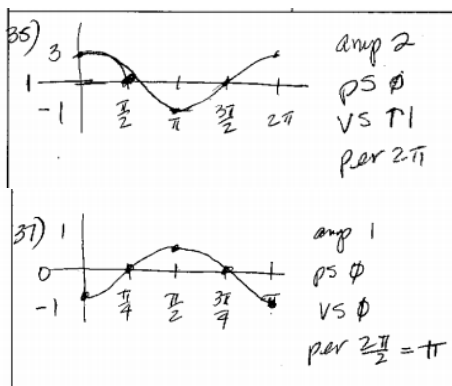
30.  $\frac{3}{5}$

31.  $\frac{4}{3}$

32.  $\frac{5}{4}$

33.  $\frac{5}{3}$

34.  $\frac{3}{4}$



39.  $J = 70^\circ$ ,  $b = 2.18$ ,  $o = 6.39$

40. 27.58 sq units

41. 64.1

42. 3282.2 m

43.  $S = 31.95$

44.  $b = 16.36$

45.  $V = 37.04$

46.  $x = 7.05$  in,  $y = 6.53$  in

