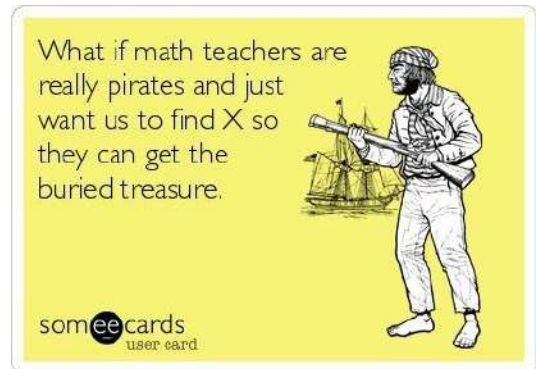This packet is a general review of concepts in this course. In this packet, you'll find:

A) Algebra II / Pre-AP Algebra II Key Concept Review (Chapters 1-8) with solutions at the bottom of each chapter review

B) Curriculum based re-teaching lessons broken down by chapter so students can see examples from each chapter if useful

C) Need some math help 24/7? Click on this link to Khan Academy. Search by topic to see examples done on video. For example, students could search "factoring quadratics" or "exponential growth and decay" or "rules of logarithms." No sign in is required.

These videos can be found at: https://www.khanacademy.org/

D) Contact your math teacher directly via e-mail or Schoology for questions, help & support. Reach out to your teachers!

Puyallup School District Virtual Learning Resources

Virtual Learning Opportunities – Puyallup Teachers will communicate lessons and activity resources through your child's Schoology Course or Group. Your child's teacher is ready to support your student through virtual learning!

Clever- a platform that makes it easier for schools to use many popular educational technology products. Essentially, it is a "bookmark" bar for the educational system- curriculum, support, and accessible links are housed in one location. You can access through PSD Favorites folder in the internet browser on a district issued device.

PSD Sites (District)

Office 365	Schoology	Common Sense Education	Destiny	EdTec TopDesk	PSD SharePoint	BusinessPLUS	Employee Online
Frontline Education	Home Access Center	IEP Online	Infofinder LE	PerformanceP LUS	Print Shop Online	PSD Website	SafeSchools

Schoology- The Puyallup School District platform teachers use to communicate, send course updates, collect assignments and assessments, host Schoology conferences (audio and video) and is the electronic gradebook.

PUYALLUP SCHOOL DISTRICT

(S) schoology

Greetings Parents and Guardians:

This school year, all students in the Puyallup School District will have an account in our new Learn Management System called **Schoology**. We encourage all parents to set up an account as well. Y

Chapter 1- Expressions, Equations, and Inequalities

1. Evaluate $3(x - 4) + 2x - x^2$ for $x = 6$ Answer: _____

2. Simplify $-(3a - 2b) - 3(-a - b)$ Answer: _____

3. Simplify $10x + 2y - 5x^2 + 2x - 5y + 6x^2$ Answer: _____

4. Solve each equation. Check your answer.

     a. $2x - 5 = 17$ x = _____   Check:

     b. $3(x + 1) = 9 + 2x$ x = _____   Check:

5. Solve each inequality. Graph the solution.

     a. $4 + 3x \geq x + 12$ Solution: _____ $\longleftrightarrow$

     b. $4 - 5x > 2$ *careful!*   Solution: _____ $\longleftrightarrow$

     c. $2(5 + 3x) < x + 4(x + 3)$ Solution: _____ $\longleftrightarrow$

6. Solve each equation. Check for any extraneous solutions by quickly checking your solutions back into the original problem to see if they actually work. ☺

     a. $|x - 5| = 3$ x = _____ & _____

     b. $|2x + 1| = 13$ x = _____ & _____

<u>SOLUTIONS</u>:

1) -18   2) 5b   3) $x^2 + 12x - 3y$ 4) a. x = 11   b. x = 6

5) a. $x \geq 4$ b. $x \leq {}^2/_5$ c. x < 2

6) a. x = 2 & 8   b. x = -7 & 6

Chapter 2 – Functions, Equations, and Graphs

1. Find the domain and range of each relation.

    a.   {(-1,3), (0,5), (1,7), (2,9)}   D: _____   R: _____

    b.   {(-2,0), (0,-1), (4,-3), (6,-4)}   D: _____   R: _____

2. Determine whether each relation is a function.

    a.   {(0,2), (4,3), (5,5), (4,7)}   b.   {(-1,0), (-5,2), (0,4), (2,-8)}

3. Find the x- and y-intercepts of each line.

    a. $5y - x = 10$

        x-intercept: (____ , ____)   y-intercept: (____ , ____)

    b. $3x + 4 = y$

        x-intercept: (____ , ____)   y-intercept: (____ , ____)

    c. $2y + 8x = -14$

        x-intercept: (____ , ____)   y-intercept: (____ , ____)

4. Write and equation of each line in slope/intercept (s/i) and point-slope (p/s) form.

    a.   slope is 2, through (1,4)

    s/i: _____   p/s: _____

    b.   slope is $-\frac{2}{3}$, through (6,-9)

    s/i: _____   p/s: _____

    c.   Passes through (5,8) and (0,-2)

    s/i: _____   p/s: _____

d.   Passes through (1,3) and (6,-2)

s/i: _____   p/s: _____
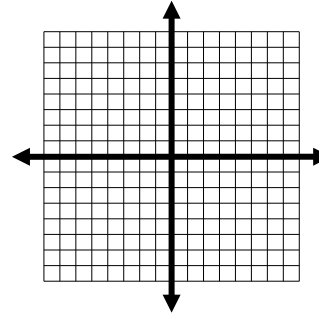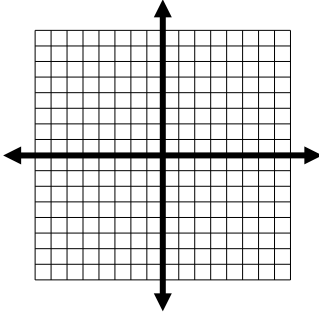
5.   Graph each equation.

a.   5y – 10 = 15x   b.   4x – 3y = -2

s/i: _____   s/i: _____

6.   Describe each transformation of the parent function y = $|x|$

   a. $y = |x-1| + 2$ Transformations: _____

   b. $y = -4|x| - 1$ Transformations: _____
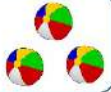
7.   Write an equation for each translation of y = x^2

   a.   y = _____   4 units down, 1 unit left

   b.   y = _____   7 units up, 3 units right

   c.   y = _____   2 units down, 6 units right
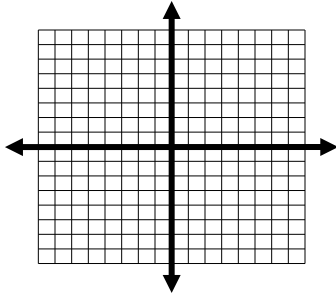
_____

Solutions: 1a. {-1,0,1,2} {3,5,7,9}   1b. {-2,0,4,6} {-4,-3,-1,0}
2a. no   2b. yes   3a. (-10,0) (0,2)   3b. $(-^4/_3, 0)$ (0,4)   3c. $(-^7/_4,0)$ (0,-7)
4a. y = 2x + 2, (y-4) = 2(x-1)   4b. y = $-^2/_3$x – 5, (y+9) = $-^2/_3$(x-6)
4c. y = 2x – 2, (y-8) = 2 (x-5)   4d. y = -1x + 4, (y-3) = -1(x-1)
5a. y = 3x+2   5b. y = $^4/_3$x + $^2/_3$
6a. right 1, up 2   6b. reflect over x-axis, vertical stretch, down 1
7a. $(x+1)^2$ - 4   7b. $(x-3)^2$ + 7   7c. $(x-6)^2$ - 2
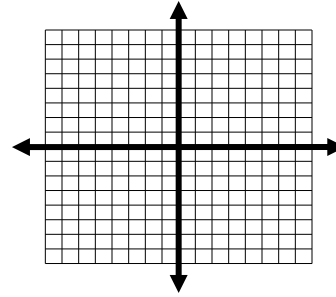
Chapter 3- Linear Systems

Solve each system by graphing. CHECK YOUR ANSWERS!

1. $\begin{cases} x + y = 3 \\ y = 3x - 1 \end{cases}$

(____,_____)

2. $\begin{cases} -x + 2y = 2 \\ 3x + 2y = -6 \end{cases}$

(____,_____)

Solve each system by <u>substitution</u>. CHECK YOUR ANSWERS!

3. $\begin{cases} x - 3y = 2 \\ -x + 2y = 5 \end{cases}$

(____,_____)

4. $\begin{cases} a - 3b = 4 \\ a = -2 \end{cases}$

(____,_____)

Solve each system by <u>elimination</u>. CHECK YOUR ANSWERS!

5. $\begin{cases} 3x + 2y = -17 \\ x - 3y = 9 \end{cases}$

(____,_____)

6. $\begin{cases} 5f + 4m = 6 \\ -2f - 3m = -1 \end{cases}$

(____,_____)

For each system, choose the solution method that seems easier to use. Explain why you made each choice. Solve each system. CHECK YOUR ANSWERS!

7. $\begin{cases} b = 2a - 5 \\ b = 3 + a \end{cases}$

(____,_____)

8. $\begin{cases} 4x - 2y = 11 \\ 4x + 3y = 6 \end{cases}$

(____,_____)

ANSWERS: 1. graph (1,2)   2. graph (-2,0)   3. (-19,-7)   4. (-2,-2)
5. (-3,-4)   6. (2,-1)   7. Sub, (8,11)   8. elim (9/4,-1)

Chapter 4- Quadratic Functions and Equations

Graph each function. How is each function a translation of f(x)=x²?
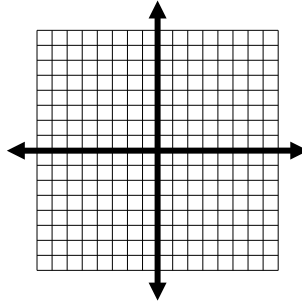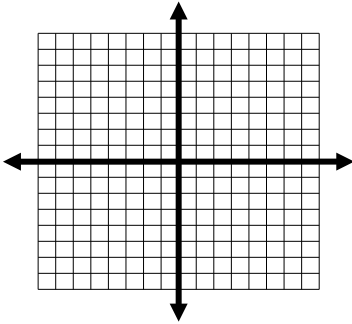
1. $f(x) = x^2 + 4$

   V(___, ___)

2. $f(x) = (x - 9)^2 + 2$

   V(___, ___)

Translation(s):_____   _____

Name the vertex for each function.

3. $f(x) = 4(x + 2)^2 - 6$
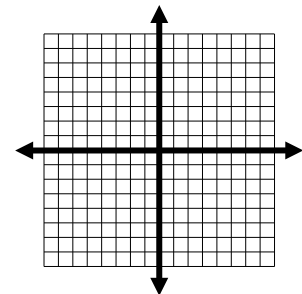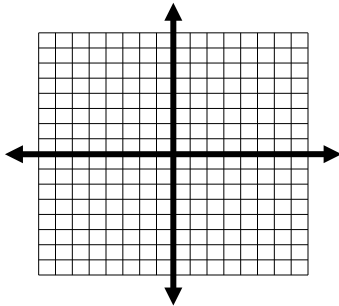
   V: (_____,_____)

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

   V: (_____,_____)

Graph each function. *Remember, you can find the x-value using x = -b/2a. Plug answer in to find y.*

5. $y = x^2 + 6x + 5$

   V: (____,_____)

6. $y = x^2 + -7x + 18$

   V: (____,_____)

Factor each expression. *Always try looking for a common factor to bring out front first!*

7. $x^2 - 8x + 12$

8. $3x^2 + 11x - 20$

9. $-4x^2 + 14x - 6$

(_____)(_____)   (_____)(_____)   ____(_____)(_____)

10. $x^2 + 14x + 40$

11. $x^2 - 14x + 49$

12. $9x^2 + 30x + 25$

(_____)(_____)   (_____)(_____)   (_____)(_____)

13. $36x^2 - 16$ 　　　　　　　14. $6x^2 - 24x$ 　　　　　　　15. $-14x^2 - 49$

____(_____)(_____)　　　　____(_____)　　　　____(_____)

What is the quadratic formula? x = _____

Solve each equation by using the quadratic formula. No decimals in solutions. Just fully-simplified square roots, etc. *Move all terms to the left and set equal to zero before your put values into formula.*

16. $3x^2 + 5x - 8 = 0$ 　　　　　　　17. $x^2 = 6x - 9$

x=_____　　　　　　　x=_____

18. $x(x - 3) = 4$ 　　　　　　　19. $5x^2 - 7x - 3 = 0$

x=_____　　　　　　　x=_____

<u>Ch. 4 Group Review</u> 　　　　*SHOW YOUR WORK, NO GRAPHING CALCULATORS*

1.　V(0,4) & 4 up	2.　V(9,2) & 9 right, 2 up	3.　V(-2,-6) & x = -2
4.　V(3,2) & x = 3	5.　V(-3,-4) & x = -3	6.　V(3.5, 5.75)　& x = 3.5
7.　(x-2)(x-6)	8.　(x+5)(3x-4) 　9.　-2(2x-1)(x-3)	
10.　(x+4)(x+10)	11.　(x-7)(x-7) 　12.　(3x+5)(3x+5)	
13.　4(3x+2)(3x-2)	14.　6x(x-4) 　15.　-7(2x²+7)	
16.　x = 1 & -8/3	17.　x = 3 & 3 ☺ 　18.　x = 4 & -1	

19.　$x = \dfrac{7 \pm \sqrt{109}}{10}$

Chapter 5- Polynomials and Polynomial Functions

1. Write the equation of a polynomial in standard form that has zeros of 5 and 2. *No parenthesis in solution.*

    f(x) = _____

2. Write the equation of a polynomial in standard form that has zeros of -3, 1, and 2.

    f(x) = _____

3. Factor each of the following and then find the zeros of each.

a. $x^2 - 5x + 6$

    Factors: (_____)(_____)   zeros at x = _____

b. $x^2 - 7x + 6$

    Factors: (_____)(_____)   zeros at x = _____

c. $x^2 - 64$

    Factors: (_____)(_____)   zeros at x = _____

d. $x^3 + 9x^2 + 20x$

    Factors: _____(_____)(_____)   zeros at x = _____

e. $x^3 - 10x^2 + 25x$

    Factors: _____(_____)(_____)   zeros at x = _____

f. $x^3 - 25x$

    Factors: _____(_____)(_____)   zeros at x = _____

g. $x^3 + 3x^2 - 10x$

Factors: _____ (_____)(_____)   zeros at x = _____

4.   FACTORING BY GROUPING $x^3 - 3x^2 - 4x + 12$

Factors: (_____)(_____)   Zeros: x = _____

5.   Use SYNTHETIC DIVISION to divide the following polynomials. *Remember place holders!*

a. $x^3 + 5x^2 - x - 5$ by $(x + 5)$ b. $2x^3 + 14x^2 - 58x$ by $(x + 10)$

Quotient: _____ Remainder: _____   Quotient: _____ Remainder: _____

6.   *Factor completely using the given factor and synthetic division.*
        $y = x^3 - 4x^2 - 11x - 6$ if $(x + 1)$ is a factor.

Factors: (x + 1) (_____) (_____)

7.   *Factor completely using the given factor and synthetic division.*
        $y = x^3 - 6x^2 + 11x - 6$ if $(x - 1)$ is a factor.

Factors: (x + 1) (_____) (_____)

Solutions: 1) $x^2 - 7x + 10$ 2) $x^3 - 7x - 6$ 3a) (x-2)(x-3) x = 2 & 3   3b) (x-1)(x-6) x = 1 & 6
3c) (x-8)(x+8) x = 8 & -8   3d) x(x+4)(x+5) x = 0, -4 & -5   3e) x(x-5)(x-5) x = 0, 5 & 5
3f) x(x-5)(x+5) x = 0, 5 & -5   3g) x(x+5)(x-2) x = 0, -5 & 2   4) (x-3)(x+2)(x-2)   x = 3, -2, 2
5a) Put -5 in corner, 1 5 -1 -5 across top, etc.   Q: $x^2 - 1$ R: 0   5b) Q: $2x^2 - 6x + 2$ R: -20
6) (x+1)(x-2)(x-3)   7) (x-1)(x-2)(x-3)

Chapter 6- Radical Functions and Rational Exponents

Find all of the REAL roots of each number WITHOUT a calculator.

1. $\sqrt{36}$

2. $\sqrt[3]{-64}$

3. $\sqrt[3]{\dfrac{-8}{125}}$

4. $\sqrt{25y^2}$

5. $\sqrt{49x^4}$

6. $\sqrt[3]{-8x^9}$

Multiply, divide, add, or subtract - then simplify final answer.

7. $\sqrt[3]{2x} \bullet \sqrt[3]{4x^5}$

8. $\sqrt{2x} \bullet \sqrt{18xy^2}$

9. $3\sqrt{180} + \sqrt{45} - 8\sqrt{20}$

10. Simplify the following using factor trees, etc. NOT calculators…

   a. $\sqrt[4]{81x^4 y^{12}}$

   b. $\sqrt[3]{\dfrac{27x^6}{8y^3}}$

11. Multiply then simplify.

   a. $\left(1 - \sqrt{5}\right)\left(2 - \sqrt{5}\right)$

   b. $\left(1 - \sqrt{7}\right)\left(1 + \sqrt{7}\right)$

12. Let $f(x) = x^2 - x - 12$ and $g(x) = x - 4$

   a. Domain of f(x): _____   Domain of g(x): _____

   c. $f(x) - 2g(x) =$ _____   Domain: _____

   d. $f(x) \bullet g(x) =$ _____   Domain: _____

   e. $\dfrac{f(x)}{g(x)} =$ _____   Domain: _____

   g. f(g(7)) = _____   h. g(f(2)) = _____

Solutions:

1. 6   2. -4   3. -2/5   4. 5y   5. 7x²
6. -2x³   7. 2x²   8. 6xy   9. 5√5
10. a. 3xy³   b. 3x²/2y   11. a. $7 - 3\sqrt{5}$ b. -6
12. a. ℛ b. ℛ   c. x² – 3x - 4   d. x³ - 5x² – 8x + 48 e. x + 3   g. -6   h. -14

Chapter 7- Exponential and Logarithmic Functions

1. $y = 2^{(x-1)} + 1$

x	y
-2	
-1	
0	
1	
2	

y-intercept @ (0, _____)

asymptote @ y = _____
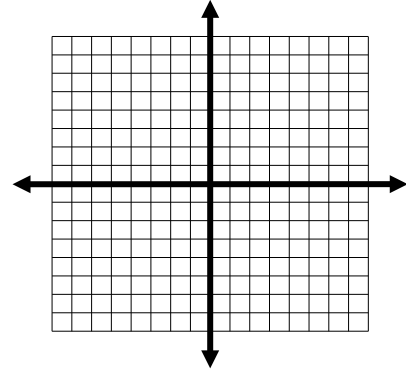
Evaluate the expressions WITHOUT using a calculator. Show set-up on the right.

2.   x = _____ $\log_{16} 4 = x$

3.   x = _____ $\log_2(.5) = x$

4.   x = _____ $\log_{1/2}(4) = x$

5.   x = _____ $\log_3 1 = x$

6.   x = _____ $\ln e = x$

7.   x = _____ $\log_5 25 = x$

8.   x = _____ $\log_2(^1/_{32}) = x$

9.   x = _____ $\log_4 64 = x$

10.   x = _____ $\log_9 3 = x$

Solve the equations WITHOUT using a calculator.

11.   x = _____ $4^{3x+1} = 32$

12.   x = _____ $10^{3x+5} = 10^{x-3}$

13.   x = _____ $\log_3(2x-1) = 2$

14.   x = _____ $\log_5(4x+1) = \log_5(2x+7)$

15.   a.   Does $f(x) = 4 \left(\frac{3}{2}\right)^x$ represent exponential growth or decay ?

   b.   How about $f(x) = 3 \left(\frac{2}{3}\right)^x$?   growth or decay?

16.   Condense & simplify the following expressions as far as possible.

   a.   _____ $3 \log x + \log 7$

   b.   _____ $2 \log x - \log 5$

   c.   _____ $3 \log 2 - 2 \log 4$

17.   Expand the expressions.

   a.   _____ $\ln 3xy$

   b.   _____ $\log x^2 y$

18.   Use the change-of-base formula to evaluate the expressions to four decimal
     places of accuracy.

   a.   _____ $\log_5 10$

   b.   _____ $\log_8 2$

Each of these four formulas assumes you have an initial amount that gains or loses a certain percentage over a certain period of time, but they are each a little different.

$A = Pe^{rt}$ growth – gains percentage compounding continuously

$A = P(1 + r/n)^{nt}$ annually growth – gains percentage compounded a certain # of times per year

$A = P(1 + r)^t$ growth – gains percentage compounded

$A = P(1 - r)^t$ decay – loses percentage compounded annually

19.   The value of a new car purchased for $22,000 decreases by 10% per year.
     How much will it be worth after 5 years?

   $_____

20.   You deposit $1000 in an account that pays 6% annual interest, compounded CONTINUOUSLY.
     Find the balance after 5 years.

   $_____

21. You deposit $6000 in an account that pays 5% annual interest, compounded MONTHLY.
Find the balance after 10 years.

$_____

22. You deposit $2000 in an account that pays 12% annual interest, compounded QUARTERLY.
Find the balance after 4 years.

$_____

23. 4000 mg of a substance is present initially, but it is decaying slowly. It loses 7% of its mass per year. How much will be present after 40 years?

_____ mg

Chapter 7 INDIVIDUAL Review Solutions
1. y-int (0,2) asymptote @ y = 1   2. ½   3. -1   4. -2   5. 0
6. 1   7. 2   8. -5   9. 3   10. ½   11. ½
12. -4   13. 5   14. 3   15. Growth, Decay
16. a) $\log 7x^3$ b) $\log x^2/5$ c) $\log ½$
17. a) $\ln 3 + \ln x + \ln y$ b) $2 \log x + \log y$
18. a) 1.4307   b) .3333   19. $12,990.78   20. $1,349.86
21. $9,882.06   22. $3,209.41   23. 219.5

(8) **Chapter 8- Rational Functions**

Simplify the following expressions. *For #4, you will need to factor the cubic using SOAP*

4. $\dfrac{4m^2n^5}{10mn^2}$

5. $\dfrac{-2x}{x-x^2}$

6. $\dfrac{9r+rs}{3r}$

7. $\dfrac{x^3-8}{x-2}$

Perform the indicated operation and simplify the result.

8. $\dfrac{3xy^5}{x^2y^3} \cdot \dfrac{y^2}{2x^2}$

9. $\dfrac{x^2-x-6}{4x^3} \cdot \dfrac{4x^2+4x}{x^2+5x+6}$

10. $\dfrac{33x^3y}{y^9} \div \dfrac{11x^4}{y^6}$

11. $\dfrac{x-3}{2x-8} \div \dfrac{x^2-9}{6x^2-96}$

12. $\dfrac{2x}{x+5} + \dfrac{7}{x+5}$

13. $\dfrac{6x^2}{x-2} - \dfrac{12x}{x-2}$

14. $\dfrac{6}{4x^2} + \dfrac{2}{5x}$

15. $\dfrac{8x-1}{x^2+x-6} - \dfrac{4}{x-2}$

Solve the following equations. Be sure to check your solutions.

18. $\dfrac{3}{2} + \dfrac{1}{x} = 2$

19. $\dfrac{2}{3x} + \dfrac{2}{3} = \dfrac{8}{x+6}$

20. $\dfrac{6x}{x+4} + 4 = \dfrac{2x+2}{x-1}$

21. $\dfrac{x-2}{x+2} = \dfrac{3}{x}$

Solutions:

4. $2mn^3$

5. $\dfrac{-2}{1-x}$

6. $(9+s)/3$

7. $x^2 + 2x + 4$

8. $\dfrac{3y^4}{2x^3}$

9. $\dfrac{(x-3)(x+1)}{x^2(x+3)}$

10. $\dfrac{3}{xy^2}$

11. $\dfrac{3(x+4)}{(x+3)}$

12. $\dfrac{2x+7}{x+5}$

13. $6x$

14. $\dfrac{15+4x}{10x^2}$

15. $\dfrac{4x-13}{(x+3)(x-2)}$

18. $x = 2$

19. $x = 2 \ \& \ 3$

20. $x = 2 \ \& \ -3/2$

21. $x = 6 \ \& \ -1$