Journals Gr 12 - MHF

Name: _____

How Journals will be marked:

NAME:	Unit :	Question chosen:		Questions to finish/see notes
Neat? Creative? Colourful subheadings? Numbered? Few pages only?	Definitions and/or diagrams? Example? Can use HW question Explanation? Correct? Answered one ✸ question?			

What I will look for in a Journal

- use your own (not copied from notes or internet) examples and concise (not long – but with enough detail) explanations. Ask yourself: "Will someone who wasn't in class be able to read your journal and understand the topic studied?" Can use point form.

- incorporate an answer to at least one of the following questions. Use a star ✸ to help me find you did so.

  Problem Solving
  • What were the advantages and disadvantages of the problem solving strategies you tried?
  • What factors make this a difficult problem?
  Reasoning and Proving
  • How can we verify this answer?
  • Why does this work?
  • What other situations need to be considered?
  Reflecting
  • How does this problem remind you of a problem you have solved before?
  • Does this problem/answer make sense to you?
  • How can this topic be used in real life? What career would use these type of skills and why?
  Connecting
  • Is an exact answer necessary for this question? Would estimation be adequate? OR Why was a calculator necessary (or helpful) for this problem? Explain.
  • Think of a different way to do the calculation that may be more efficient.
  Representing
  • How do these different representations connect to one another?
  • When could this mathematical concept or procedure be used in daily life?
  Communicating
  • How could you represent this idea algebraically? OR graphically? OR What properties would you have to use to construct a dynamic representation of this situation? OR In what way would a scale model help you solve this problem?
  • What would different representations of this problem demonstrate?

- be creative, use different colours, number each question, create a design/cartoon theme
- do not take up too much space, you are only given one booklet! Write small, think of this as your 'cheatsheet'.

Each Journal will be due the DAY BEFORE the TEST. After that, every day you'll lose 5% per day, and get a zero once the journals are returned.

Remember it is in your best interest to do ALL the Journal questions well because
- you don't know which question will be chosen or if ALL of it will be looked at
- it will be marked as Communication Part of the TEST – which is 10% of your final mark

- it helps you study
- you can keep it for future math courses as a reference

UNIT 1
FUNCTIONS – journal   **NAME:**_____

1. FUNCTIONS vs NON FUNCTIONS
   a. Graphs & equations
   b. Function notation
2. TRANSFORMATIONS
3. INVERSES
   a. Equations
   b. Graphs
4. PIECEWISE FUNCTIONS
   a. Word problems and find equation from a sketch
   b. Graphing from equation
   c. Continuity (leave space to do an example of finding a constant that makes a function continuous – will learn this at the end of the unit)
5. ABSOLUTE VALUES
   a. 2D versus 1D graphs
   b. Solve algebraically
   c. Solve graphically, using centre and radius
6. END BEHAVIOUR
7. ODD & EVEN & NEITHER SYMMETRY
   a. Graphs
   b. Equation proofs
8. PARENT FUNCTIONS: graphs, equations, domain and range, end behaviour, symmetry
   a. Linear
   b. Quadratic
   c. Cubic
   d. Quartic
   e. Cube root
   f. Square root
   g. Absolute value
   h. Rational
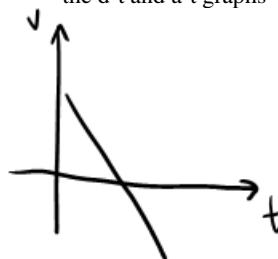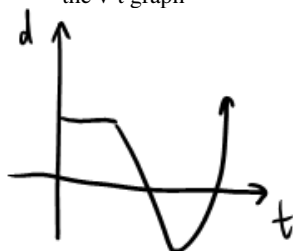   i. Exponential growth and decay

Use your own (not copied from notes or internet) examples and concise (not long – but with enough detail) explanations. Include definitions and diagrams if necessary and don't forget to include at least one star ✹ question.

UNIT 2
RATES - journal   **NAME:**_____

1. RATES of CHANGE
   a. Units - how to record them properly
   b. Secant vs tangent lines
   c. Average Rates
2. INSTANTANEOUS RATES
   a. Using a graph
   b. Using preceding and following intervals
   c. Using squeezed intervals
3. DIFFERENCE QUOTIENT
   a. Polynomial function
   b. Rational function
   c. Square root function
   d. Name some functions where it is impossible to use the difference quotient to find the exact value, explain why.
4. GPAPHICAL MODELS
   a. For the d-t graph below explain what's going on and sketch the v-t graph
   b. For the v-t graph below explain what's going on and sketch the d-t and a-t graphs

5. ABSOLUTE max/min
   a. Explain the difference between absolute max and local max
   b. Show an example of finding absolute max and min on a closed interval. Choose a function with a turning point.

Use your own (not copied from notes or internet) examples and concise (not long – but with enough detail) explanations. Include definitions and diagrams if necessary and don't forget to include at least one star ✹ question.

UNIT 3
POLYNOMIALS - journal   NAME:_____

1. POLYNOMIALS
    a. Graphs
    b. Equations
    c. Tables
2. DEGREE and leading coefficient from:
    a. Standard form
    b. Factored form
3. CHARACTERISTICS of ODD and EVEN degree polyn
    a. Domain & Range
    b. End behaviour
    c. Symmetry
    d. Number of possible zeros and turning points from
        i.   STANDARD FROM, list possibilities
        ii. Factored form (can see exactly how many in this form)
        iii. Transformed form (can see exactly how many in this form)
4. EQUATIONS vs GRAPHS
    a. FACTORED FORM – ensure you cover "cut, bounce, bend" (show how to go from graph to equation and vise versa)
    b. TRANSFORMED FORM (from graph to equation and vise versa)
5. DIVIDING POLYNOMIALS
    a. Explain the terms divisor, dividend, remainder, quotient and how they all relate to one another.
    b. Long division
    c. Synthetic division (make a note of how to record the result properly – especially for synthetic division that may have a divisor with a coefficient on x).
    d. Discuss why you would need to know the long division method, not just the synthetic division method.
6. THEOREMS & APPLICATIONS
    a. Remainder Theorem and how to use it
    b. Rational Root Theorem and how to use it
    c. Factor Theorem and how to use it to factor a cubic/quartic fully.
7. COMPARING COEFFICIENTS
8. SUM & DIFFERENCE OF CUBES

Use your own (not copied from notes or internet) examples and concise (not long – but with enough detail) explanations. Include definitions and

diagrams if necessary and don't forget to include at least one star ✳ question.

UNIT 4
POLYNOMIAL EQUATIONS & INEQUALITIES– journal   NAME:_____

1. FAMILY of FUNCTIONS vs UNIQUE FUNCTIONS
2. FINDING the EQUATION from a TABLE (use your own example that is cubic)
3. POLYNOMIAL INEQUALITIES
    a. Why need new methods? Explain using examples why you can't divide/multiply by x, or split factors and solve them separately.
    b. Sketching related function solution
    c. +/- chart solution

Use your own (not copied from notes or internet) examples and concise (not long – but with enough detail) explanations. Include definitions and

diagrams if necessary and don't forget to include at least one star ✳ question.

UNIT 5
RATIONALS – journal   **NAME:**_____
1. CHARACTERISTICS of RATIONALS (don't forget to define each)
    a. Holes, define and explain how to know 'how high' (y value) to draw them
    b. Zeros (explain cut, bounce, bend - from polynomial unit applies for rationals too. Zeros are not always found from factors of the numerator, explain)
    c. Vertical Asymptotes (explain behaviour near Vas - how you can be on the same or opposite direction of the asymptote)
    d. Horizontal Asymptotes
        (talk about long way as well as tye shortcut, include degree conditions for $y = 0$ and $y \neq 0$ and no HA)
    e. Oblique Asymptotes
2. GRAPHING examples: (in each ex label intercepts and asymptotes as equations)
    a. A transformed parent rational
    b. Reciprocal graphs (ex. $\dfrac{1}{quadratic}$ quadratic has NO zeros)
    c. $\dfrac{linear}{linear}$ With a cancelation.
    d. $\dfrac{linear}{quadratic}$ no cancelations, and quadratic has zeros
    e. $\dfrac{quadratic}{linear}$ no cancelations, and quadratic has zeros

3. RATIONAL INEQUALITIES
    a. Why cross multiplying will not work
    b. +/- chart and how to record final answers – zeros vs restrictions
4. WORD PROBLEMS
    a. At lest two different types – explanation of set up
    b. Solve the above problems

Use your own (not copied from notes or internet) examples and concise (not long – but with enough detail) explanations. Include definitions and

diagrams if necessary and don't forget to include at least one star ✹ question.

UNIT 6
TRIGONOMETRY - journal   NAME:_____

1. Summarize working with radicals, if you have not done it in Unit 0 journal, insert it here
2. RADIAN MEASURE
    a. What is it
    b. How to convert degrees vs radians vs revolutions
    c. Importance of recording units example
    d. Rotational/radian word problems (at least two)
3. WRITING THINGS PROPERLY

» what is x in the example?

    a. Discuss the difference between what is an angle and what is a ratio (record what you must do first when you're given the angle, and what you must do first when you're given the ratio.)

ex. $\tan\dfrac{3\pi}{8} = x$ *versus* $\sin x = \dfrac{3}{8}$

    b. Explain why & correct these (they are written improperly)

ex. $\sin\dfrac{10\pi}{3} = 600°$ $\sin = \dfrac{1}{2}$ $\sec\dfrac{5\pi}{6} = \cos\dfrac{6}{5\pi}$ ←*2 mistakes*

$2\ \sec\dfrac{\pi}{8} = \dfrac{1}{2\cos\frac{\pi}{8}}$ $\sec\theta = -\dfrac{3}{2} = \cos\theta = \dfrac{-2}{3}$ $\tan\dfrac{5\pi}{3} = \tan^{-}\dfrac{\sqrt{3}}{1}$

4. SOLVING for ANGLES
    a. If ratios are 0, +1, -1, undefined, find $\theta_1, \theta_2...etc$
    b. If ratios are made up of numbers from special triangles, 1, $\sqrt{2}$, 2, $\sqrt{3}$ (include some negatives), find $\theta_1, \theta_2...etc$
    c. If ratios are not like the ones above, not from special triangle, find $\theta_1, \theta_2...etc$
5. FINDING EXACT VALUES of RATIOS
    a. Given an angle (not in quadrant I) that relates to a $\pi/4$ special triangle, find y/r or some other trig ratio
    b. Given an angle (not in quadrant I) that relates to a $\pi/3$, or $\pi/6$ special triangle, find y/r or some other trig ratio
    c. Given one ratio and find other ratios for the same angle
6. SKETCHING
    a. PARENT GRAPHS - Primary trig & Secondary trig (note not the same as inverse trig)
    b. TRANSFORMED GRAPHS – one of cosecant/secant, one of tangent/cotangent, and one of sine/cosine
7. SINUSOIDAL WORD PROBLEMS
    a. How to find y if given x
    b. How to find x if given y
8. FINDING PERIOD and k value for SINUSOIDALS
    a. Given w = rev/sec
    b. Given w = rad/sec
    c. Given v = cm/sec and radius

Use your own (not copied from notes or internet) examples and concise (not long – but with enough detail) explanations. Include definitions and

diagrams if necessary and don't forget to include at least one star ✴ question.

UNIT 7
TRIG IDENTITIES AND EQUATIONS - journal   NAME:_____

1. Staple in formula sheet as reference for yourself
2. EQUIVALENT TRIG RATIOS
3. EXACT VALUES
    a. Given a compound angle
    b. Given a half angle
    c. Given one ratio with θ find a ratio with θ/2.
4. PROOFS
    a. Things to try
    b. Examples showing proper form with explanations
5. SOLVING TRIG EQUATIONS
    a. Factoring not needed with "k" value
    b. Factoring needed

Use your own (not copied from notes or internet) examples and concise (not long – but with enough detail) explanations. Include definitions and

diagrams if necessary and don't forget to include at least one star ✴ question.

UNIT 8
EXPONENTIALS AND LOGARITHMS - journal   NAME:_____

1. REVIEW EXPONENTIAL RELATIONS
    a. Make a note to see the review journal for some topics (make sure that journal is done)
    b. Find exponential equations. (Examples of how to find equation from a graph or from a table – be careful – it matters if there is a HA or not…)
    c. Exponent laws-apply them in complicated examples with explanations of what how you solved them.
2. LOGARITHMS
    a. What are they, definition
    b. How to switch forms
    c. Inverses (complicated example please)
    d. Explain what buttons are available to use and how to do calculations of different bases
3. GRAPHS of EXP & LOGS
    a. Parent exponential $b > 1, 0 < b < 1$ and logarithm $b > 1, 0 < b < 1$
    b. Transformed ex of exp and log
4. LOGARITHM LAWS
    a. Expand terms
    b. Condense terms
5. SOLVING EQUATIONS
    a. Exponentials by matching bases
    b. Exponentials by switching form AND taking log of both sides
    c. Logarithms by equating inputs (matching bases)
    d. Logarithms by switching forms
6. WORD PROBLEMS with logs. (pH, L, M)

Use your own (not copied from notes or internet) examples and concise (not long – but with enough detail) explanations. Include definitions and diagrams if necessary and don't forget to include at least one star ✸ question.