



Joliet West High School - District 204

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Dear Parents and Guardians,

Your child is currently enrolled to take Honors Precalculus this fall. Please be advised that this course has a summer assignment. The assignment consists of the first **two chapter tests** from our Joliet Junior College text. The assignment is to be submitted to Joliet West's Main office **by August 8th** so that it may be graded prior to the start of our fall term to be able to give students feedback. Directions were given to students and are posted on the West homepage under the Academics tab where AP work is located. We have attached them for your convenience. We added the supply list to this attachment so that students may be prepared for the start of the year.

These two tests cover prerequisites learned in previous courses. (There is one problem, number 8 on the Chapter 1 test, that students will likely need to look up because more advanced notation is used for a basic topic learned back in Algebra 1.) If your child is finding the material difficult, (s)he may wish to contact the school to change his/her placement to the College Prep Precalculus course where this material will be taught as part of the course. Students who earned a C or D in a previous course will likely find the College Prep Precalculus class better suited for them. Mr. Almon will be at the Joliet Library (Black Road Branch) on Tuesday August 7th from 12:00 – 2:00pm to answer any questions.

The assignments may be dropped off at the Joliet West Main office earlier than the August 8 deadline. Office staff will check off your child's name for the submittal of the assignment.

Some students may be considering the Dual Credit option discussed with them by their counselor during the registration process. Students may take the ALEKS placement test to determine whether they qualify for this option. There is NO charge for the test and it can be taken at JJC's Academic Skills Center in the A-building of the Main Campus throughout the summer Monday through Thursday 8 a.m. to 7:30 p.m. The placement test must be completed prior to the start of classes in August. Seniors may qualify by **math sub scores** from the ACT (23+) or SAT (590+). Students coming in with strong A/B averages from the Honors Advanced Algebra course are typically good candidates for the Dual Credit option.

We hope you find this information useful in helping your child be successful!

Best regards,
Mr. Matt Almon & Mr. Paul Fracaro
Joliet West Mathematics Teacher
Joliet Junior College Dual Credit Instructor

Attention West Honors Precalculus Students

Complete the following assignment-- **due no later than August 8** (so work can be graded prior to first class session). You may turn in earlier than this!

- West students **drop off at West Campus Main Office** for Mr. Almon & Mr. Fracaro. There will be a check list to be initialed.

You may do your work on the paper provided, if you need additional room use a separate piece of paper. Make sure to keep it organized and easy to follow, **ALL ANSWERS MUST BE ON ORIGINAL ASSIGNMENT**. A copy of the assignment is posted under the Academics tab (then to Advanced Placement tab--lower right rail) on the West home page as PDF files in case you lost the copy you were given prior to the end of the school year.

These tests cover lessons taught in previous courses and are **prerequisite for your success**. Practice to maintain your skills over the summer. Use notes from previous courses as aids. Look information up as needed. Getting together with a study partner may help, too. Refreshers and tutorials may be searched on the internet. I (Mr. Almon) will be at the Joliet Public Library (Black Road Branch) on Tuesday August 7th from 12:00-2:00pm if you have questions on the assignment, you may also email malmon@jths.org or pfracaro@jths.org (Mr. Fracaro).

- Your work will be graded and will be discussed in class.
- All problems must be attempted with appropriate work shown. Label sub-parts of problems.
- Complete all graphs - remember to indicate scale and label axes.
- For problems requesting use of the graphing calculator, please be sure to copy information/sketches from your viewscreen onto your work paper.

Notice:

For this class, you will need both your scientific calculator and your graphing calculator so have them with you for class every day.

Daily supplies:

Text book
1.5-2-inch binder
4-5 dividers
Both calculators (scientific & graphing)
Loose leaf paper
Ruler/Straight edge
Graph paper

Optional supplies:

Pencil Pouch
Pencils & eraser
3x5 index cards
Colored pencils & highlighter

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Chapter 1 (exam)

1. i) Determine whether each relation represents a function.
 ii) For each function, state the domain and range.

a) $\{(2, 5), (4, 6), (6, 7), (8, 8)\}$

b) $\{(1, 3), (4, -2), (-3, 5), (1, 7)\}$

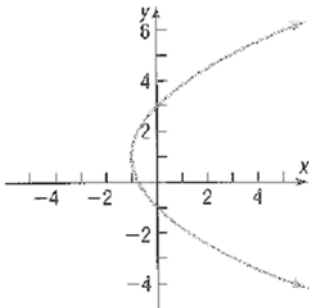
i)

i)

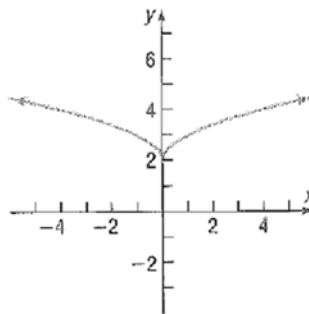
ii)

ii)

c)



d)



i)

i)

ii)

ii)

In problems 2 – 4; i) Find the domain of each function, ii) Evaluate each function at $x = -1$

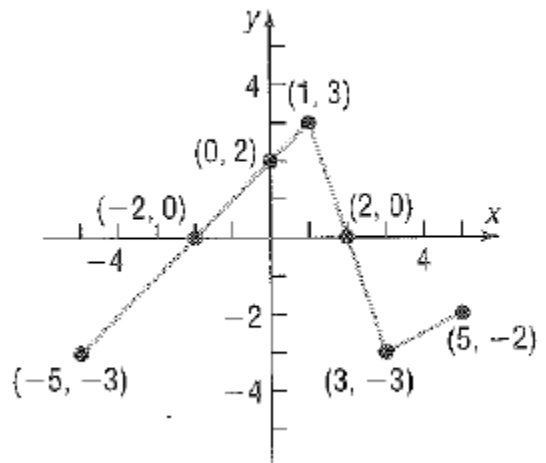
2. $f(x) = \sqrt{4 - 5x}$

3. $g(x) = \frac{x+2}{|x+2|}$

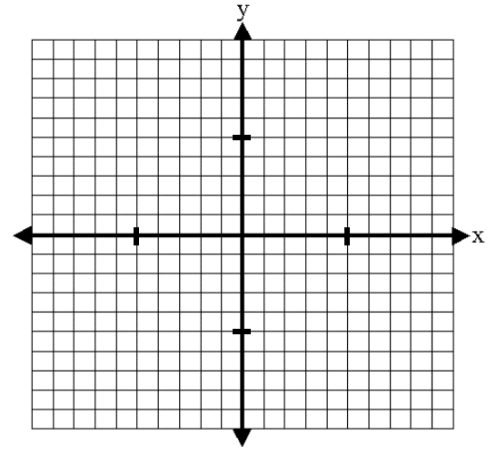
4. $h(x) = \frac{x-4}{x^2+5x-36}$

5. Using the graph of the function f to the right:

- a) Find the domain and the range of f .
 b) List the intercepts.
 c) Find $f(1)$
 d) For what value(s) of x does $f(x) = -3$?
 e) Solve $f(x) < 0$
 f) List the zeros of f

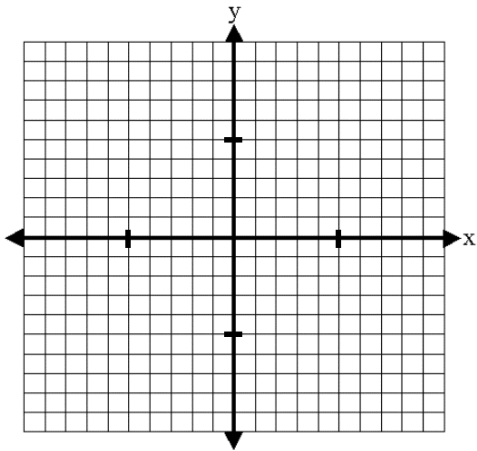


6. i) Use a graphing utility to graph the function $f(x) = -x^4 + 2x^3 + 4x^2 - 2$ on the interval $(-5, 5)$. (copy to the paper)
 ii) Approximate any local maxima and local minima rounded to the hundredth place.
 iii) Determine where the function is increasing and where it is decreasing.



7. Consider the function $g(x) = \begin{cases} 2x + 1, & \text{if } x < -1 \\ x - 4, & \text{if } x \geq -1 \end{cases}$

a) Graph the function



b) List the intercepts.

c) Find $g(-5)$

d) Find $g(2)$

8. For the function $f(x) = 3x^2 - 2x + 4$, find the average rate of change of f from 3 to x . (you will need to look this up)

9. For the functions $f(x) = 2x^2 + 1$ and $g(x) = 3x - 2$, find the following and simplify:

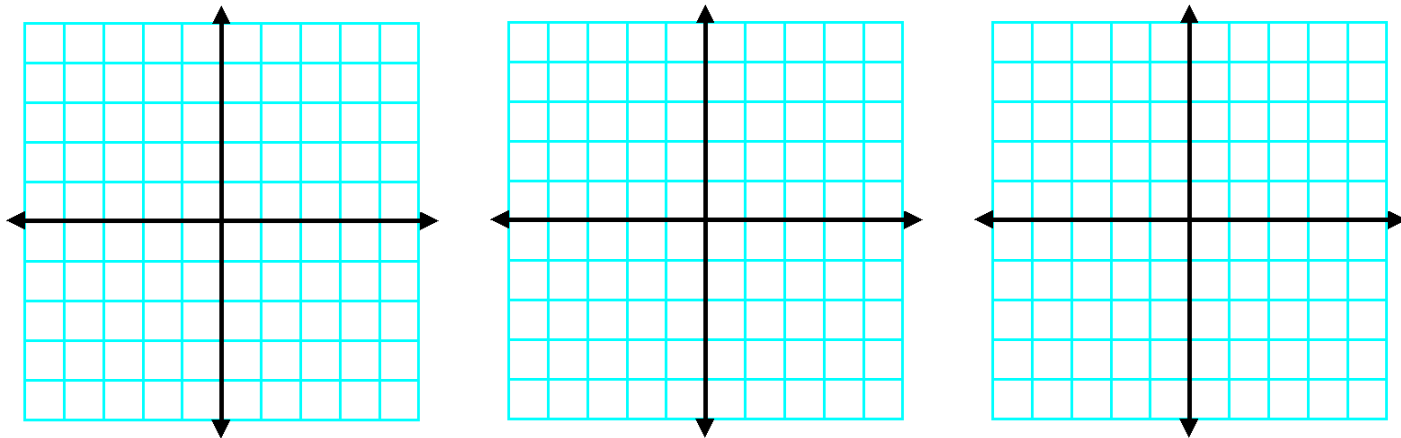
a) $f - g$

b) $f \cdot g$

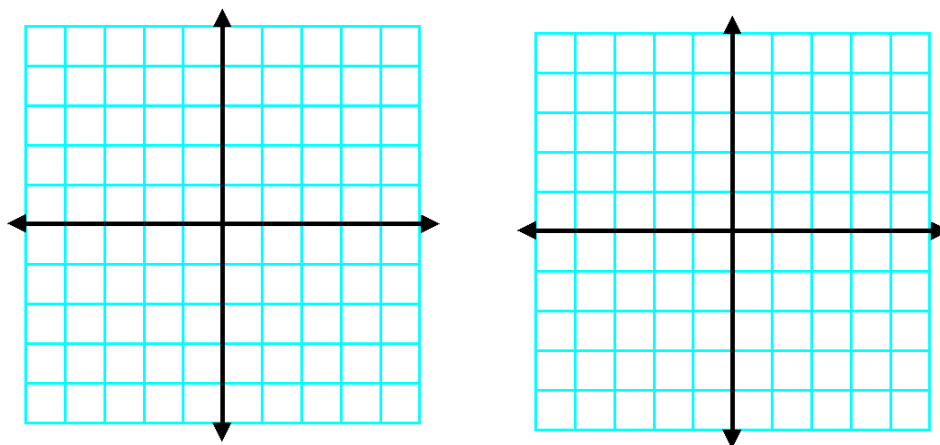
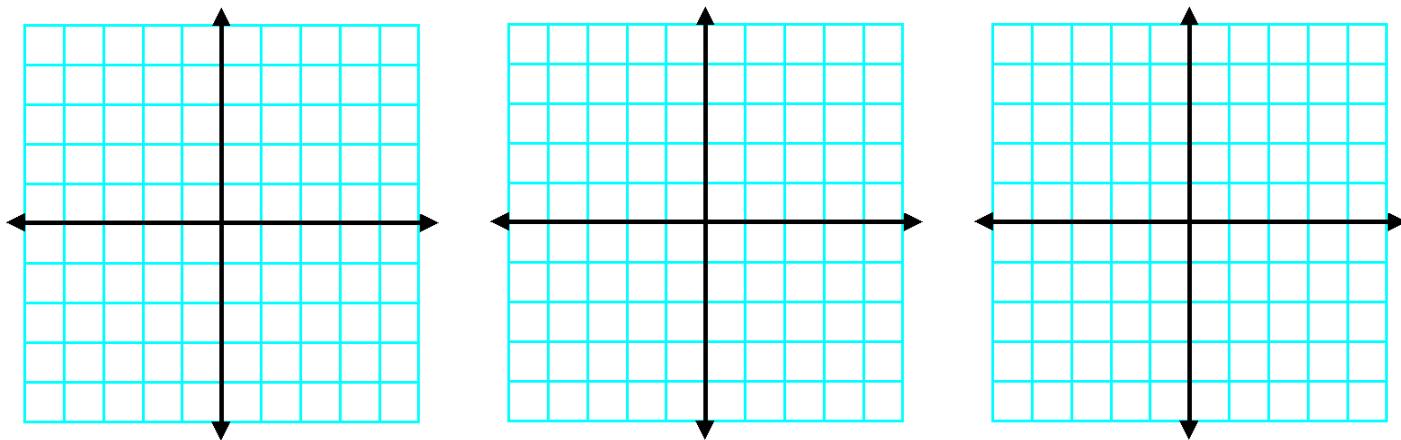
c) $f(x + h) - f(x)$

10. Graph each function using the techniques of shifting, compressing or stretching, and reflections. Start with the graph of the basic function and show ALL stages.

a) $g(x) = |x + 4| + 2$



b) $h(x) = -2(x + 1)^3 + 3$



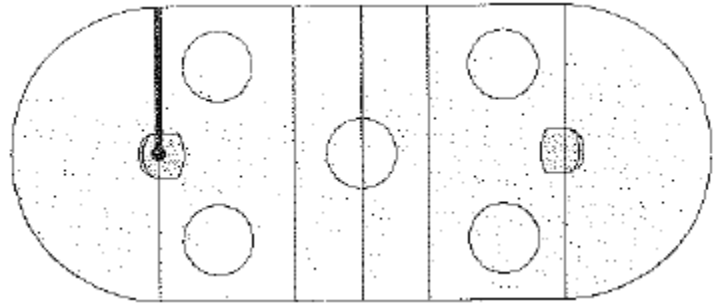
11. The variable interest rate on a student loan changes each July 1 based on the bank prime loan rate. For the years 2004 – 2016, this rate can be approximated by the model $r(x) = -0.115x^2 + 1.183x + 5.623$, where x is the number of years since 2004 and r is the interest rate as a percent.

a) Use a graphing utility to estimate the highest rate during this time period. During which year was the interest rate the highest?

b) Use the model to estimate the rate in 2020. Does this value seem reasonable?

12. A community skating rink is in the shape of a rectangle with semicircles attached at the ends. The length of the rectangle is 20 feet less than twice the width. The thickness of the ice is 0.75 inch.

a) Write the ice volume, V , as a function of the width, x .



b) How much ice is in the rink if the width is 90 feet?

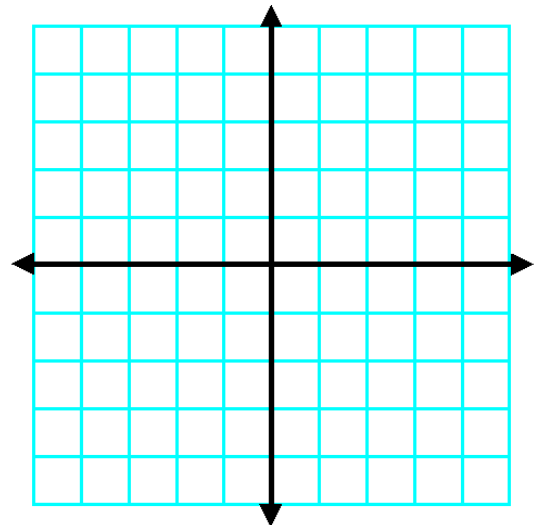
Chapter 2 (exam)

1. For the linear function $f(x) = -4x + 3$,

a) Find the zero of f .

b) Determine whether f is increasing, decreasing, or constant

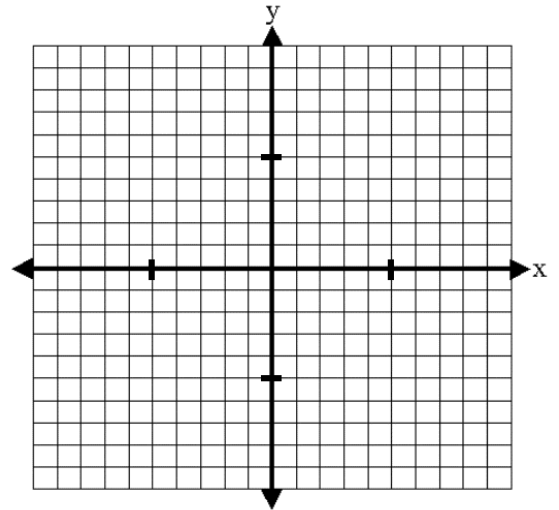
c) Graph f .



2. Find the zeros for $f(x) = 3x^2 - 2x - 8$

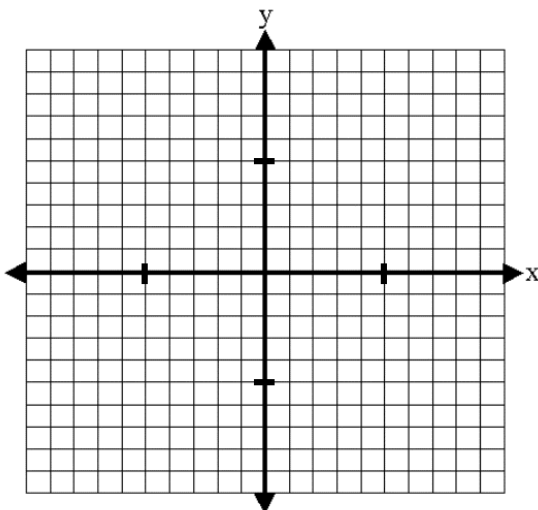
3. Find the zeros for $g(x) = -2x^2 + 4x + 1$

4. Given that $f(x) = x^2 + 3x$ and $g(x) = 5x + 3$, solve $f(x) = g(x)$. Graph each function and label the points of intersection.



5. Find the real zeros of $f(x) = (x - 1)^2 + 5(x - 1) + 4$

6. Graph $f(x) = (x - 3)^2 - 2$ using transformations.



7. For the quadratic function $f(x) = 3x^2 - 12x + 4$,

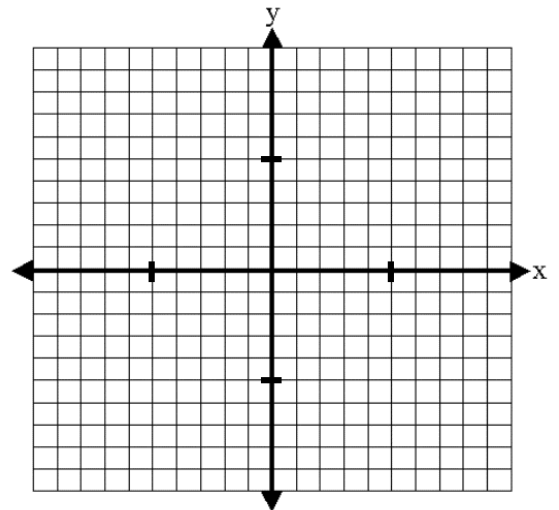
a) Determine whether the graph opens up or down.

b) Determine the vertex.

c) Determine the axis of symmetry

d) Determine the intercepts.

e) Use the information from parts (a) – (d) to graph f .



8. Determine whether $f(x) = -2x^2 + 12x + 3$ has a maximum or minimum value. Then find the maximum or minimum value.

9. Solve $x^2 - 10x + 24 \geq 0$.



10. Find the complex zeros of $f(x) = 2x^2 + 4x + 5$. (hint: use the quadratic formula)

11. Solve $|3x + 1| = 8$.

For problems 12 and 13,

- a) Solve each absolute value inequality.
- b) Express your answer in set-builder notation.
- c) Express your answer in interval notation.
- d) Graph the solution set on a number line.

12. $\left|\frac{x+3}{4}\right| < 2$

13. $|2x + 3| - 4 \geq 3$



14. The weekly rental cost of a 20-foot recreational vehicle is \$129.50 plus \$0.15 per mile.

a) Find a linear function that expresses the cost C as a function of miles driven m .

b) What is the rental cost if 860 miles are driven?

c) How many miles were driven if the rental cost is \$213.80?