

Extra Topics Calendar

Name

Kretsch

Date	Day	Assignment
12/1/2022	Thursday	Ch 5 Test
12/2/2022	Friday	
12/5/2022	Monday	Extra Topics Day 1 Notes
12/6/2022	Tuesday	HW: Extra Topics Day 1
12/7/2022	Wednesday	Extra Topics Day 2 Notes
12/8/2022	Thursday	HW: Extra Topics Day 2
12/9/2022	Friday	Semester Review Worksheet #1
12/12/2022	Monday	
12/13/2022	Tuesday	Semester Review Worksheet #2
12/14/2022	Wednesday	
12/15/2022	Thursday	Semester Review
12/16/2022	Friday	
12/20/2021	Tuesday	Final Exams
12/21/2021	Wednesday	
12/22/2021	Thursday	

HW: none! Enjoy your Winter Break! 😊

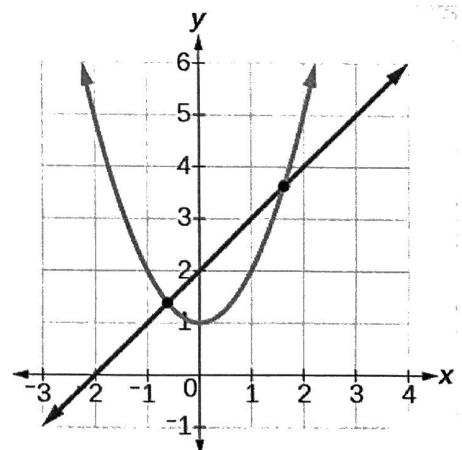
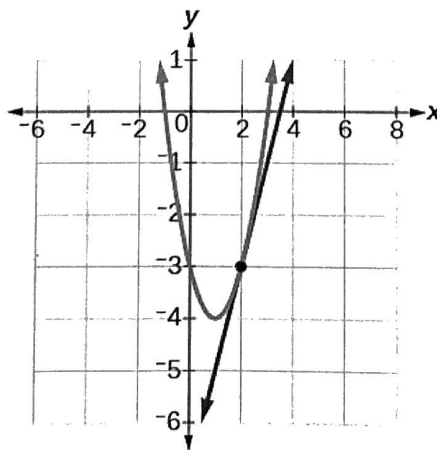
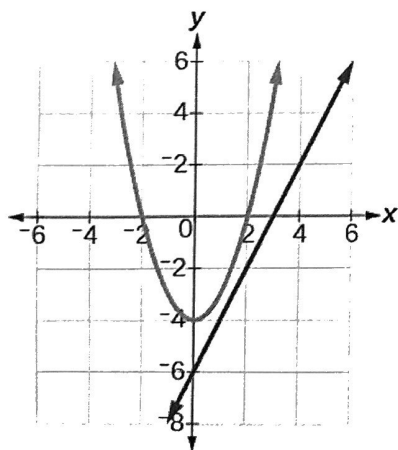
Extra Topics Day 1 Notes: Systems

Systems of Non-linear Equations

Given a system of two equations (including non-linear equations), then the solution(s) are the coordinates of any points of intersection.

Examples 1 – 3: Find the solution(s) of the systems graphed below.

1) no solution

2) $(2, -3)$ 3) $(1.6, 3.6)$ & $(-0.6, 1.4)$ 

* can use technology

Examples 4 – 5: Use a graphing calculator to find the x -coordinates of the solutions for $f(x) = g(x)$. As needed, round to two decimal places.

$$\begin{aligned} 4) f(x) &= x^2 \\ g(x) &= x + 2 \end{aligned}$$

$$(-1, 1) \text{ and } (2, 4)$$

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

$$g(x) = 2|x + 1| - 4$$

$$(-0.67, -3.33) \text{ and } (2, 2)$$

1) Enter each equation, press graph.

2) press 2nd trace, then select "Intersect"

Example 6: Solve the system algebraically. Write your answer in simplified radical form.

$$\begin{cases} 3x^2 + 5x + 2y + 8 = 7 \\ 3x - y = 10 \end{cases}$$

If using elimination,
must eliminate y .

Substitution

$$-y = 10 - 3x$$

$$y = -10 + 3x \quad \text{Substitute}$$

$$3x^2 + 5x + 2(-10 + 3x) + 8 = 7$$

$$3x^2 + 5x - 20 + 6x + 8 = 7$$

$$3x^2 + 11x - 12 = 7$$

$$3x^2 + 11x - 19 = 0$$

$$x = \frac{-11 \pm \sqrt{121 - 4(3)(-19)}}{2(3)} = \frac{-11 \pm \sqrt{349}}{6}$$

Elimination

$$3x^2 + 5x + 2y = -1 \rightarrow 3x^2 + 5x + 2y = -1$$

$$2(3x - y) = 2(10) \rightarrow 6x - 2y = 20$$

$$3x^2 + 11x = 19$$

$$3x^2 + 11x - 19 = 0$$

Systems of Non-Linear Inequalities

Reminder:

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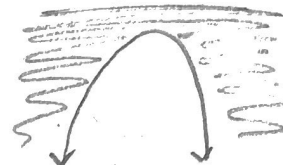
≤



>



≥



Examples 1 – 4: Match each system of inequalities with the correct graph below.

System	Graph	
1) $\begin{cases} y < 2(x-1)^2 - 4 \\ y \geq 3x + 2 \end{cases}$ D	A.	C.
2) $\begin{cases} y > 2(x-1)^2 - 4 \\ y \geq 3x + 2 \end{cases}$ C	B.	D.
3) $\begin{cases} y > 2(x-1)^2 - 4 \\ y < 3x + 2 \end{cases}$ F	E.	F.
4) $\begin{cases} y \leq 2(x-1)^2 - 4 \\ y < 3x + 2 \end{cases}$ A		

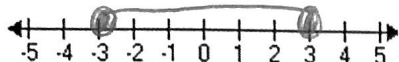
Extra Topics Day 2 Notes: Absolute Value Inequalities

Consider each absolute value inequality below. Shade the regions on each provided number line that you believe would provide values of x that would make each inequality true.

The set of #'s that are 3 units

$$|x| \leq 3 \quad \text{or less from}$$

0.

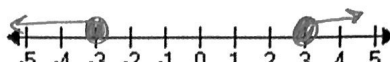


$$-3 \leq x \leq 3$$

The set of #'s that

$$|x| \geq 3$$

are 3 units or more from 0.



$$x \leq -3 \text{ or } x \geq 3$$

Absolute Value Inequalities: "And" versus "Or"

$$\min \leq x \leq \max$$

$$x < \min \text{ or } x > \max$$

Steps for solving absolute value inequalities:

1. Isolate the absolute value

2. Set up 2 inequalities (flip for the negative)

Examples: Solve each absolute value inequality and graph its solution.

1) $|x - 1| > 3$

2) $-2|x| + 5 \leq -7$

$$x - 1 > 3 \quad x - 1 < -3$$

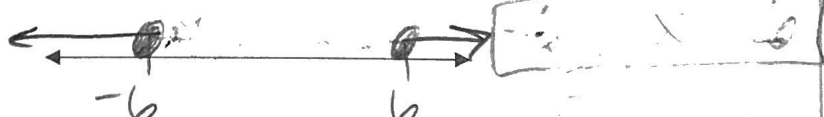
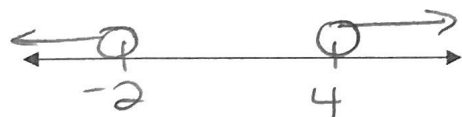
$$-2|x| \leq -12$$

$$x > 4 \text{ or } x < -2$$

$$|x| \geq 6$$

$$(-\infty, -2) \cup (4, \infty)$$

$$x \geq 6 \text{ or } x \leq -6$$



3) $4|2x + 3| \geq 12$

4) $|x + 2| + 7 < 2$

$$|2x + 3| \geq 3$$

$$|x + 2| < -5$$

$$2x + 3 \geq 3 \quad 2x + 3 \leq -3$$

No solution

$$2x \geq 0$$

$$2x \leq -6$$

$$x \geq 0 \text{ or } x \leq -3$$

