Christ the King Diocesian HIgh School
AQR / Calculus
Summer Math Packet

This packet will help you review basic algebra concepts.

- Please show all your work. No work No Credit!!!
  (if you need more room use loose leaf paper to do your work and staple it to the corresponding worksheet)
- You will be expected to do a worksheet every week.
- Do not wait to do all of the worksheets at one time.
- This packet will be due Wednesday August 16, 2023

Proposed schedule

Worksheet	Date: Week of
Worksheet 1	June 5
Worksheet 2	June 12
Worksheet 3	June 19
Worksheet 4	June 26
Worksheet 5	July 3
Worksheet 6	July 10
Worksheet 7	July 17
Worksheet 8	July 24

Teacher/User Name: L. Taylor

Summer Math AQR/ Calculus Page 1 Converting Radicals to Exponents

Name:_____

Period: _____ Date: _____

Rewrite in rational form:

1) $m\sqrt[9]{m}$

2) $\sqrt[6]{z^4 s^4}$

3) $\sqrt{q}$

4) $\sqrt[3]{b}$

5) $\sqrt[5]{c}$

6) $\sqrt[5]{v^2}$

7) $m^2\sqrt[6]{m}$

8) $k^3 n^5\sqrt{k n}$

Teacher/User Name: L. Taylor

Summer Math AQR/ Calculus Page 2 Converting Exponents to Radicals

Name:_____

Period: _____ Date: _____

Rewrite in radical form:

1) $e^{1/4}$

2) $c^{4/5}w^{11/10}$

3) $d^{9/4}y^{13/4}$

4) $d^{2/7}$

5) $t^{1/6}$

6) $y^{3/5}v^{13/5}$

7) $d^{15/7}q^{12/7}$

8) $q^{1/3}$

9) $b^{13/9}$

10) $v^{9/4}y^{1/4}$

Teacher/User Name: L. Taylor

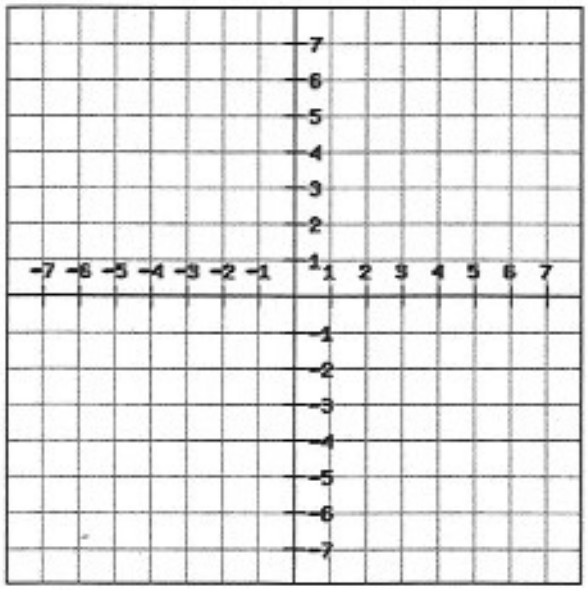
Summer Math AQR/ Calculus Page 3 Graphing Absolute Value Equations

Name:_____

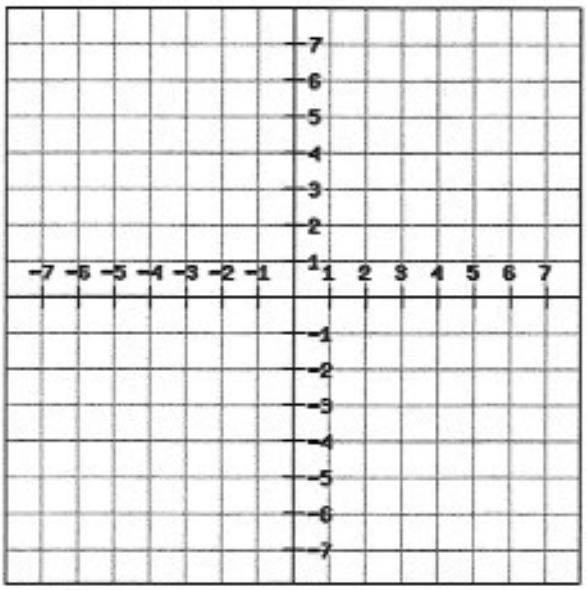
Period: _____ Date: _____

Graph:

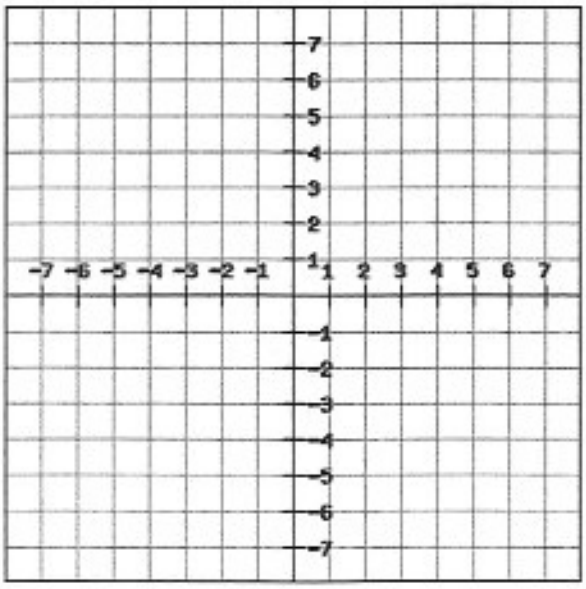
1) $y = {}^{3}/_{2}\,|2x+4| - 4$



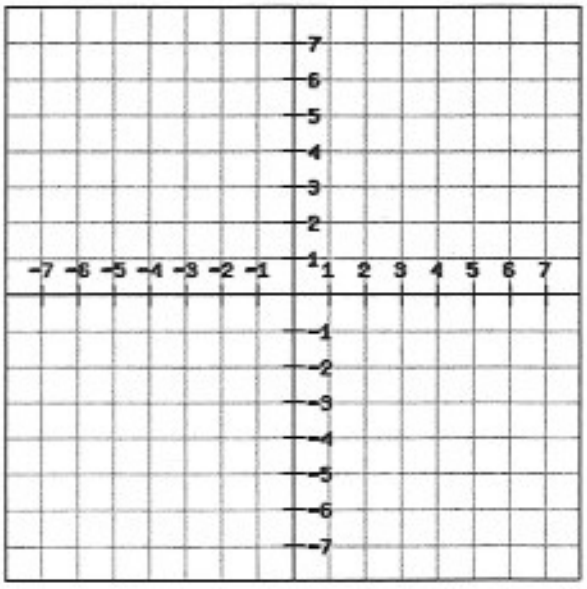
2) $y = {}^{-1}/_{5}\,|5x-10| - 1$



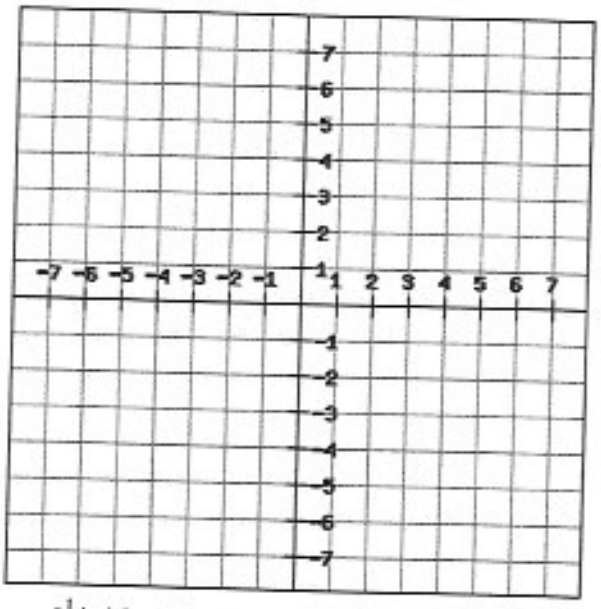
3) $y = {}^{1}/_{3}\,|6x-12| + 1$



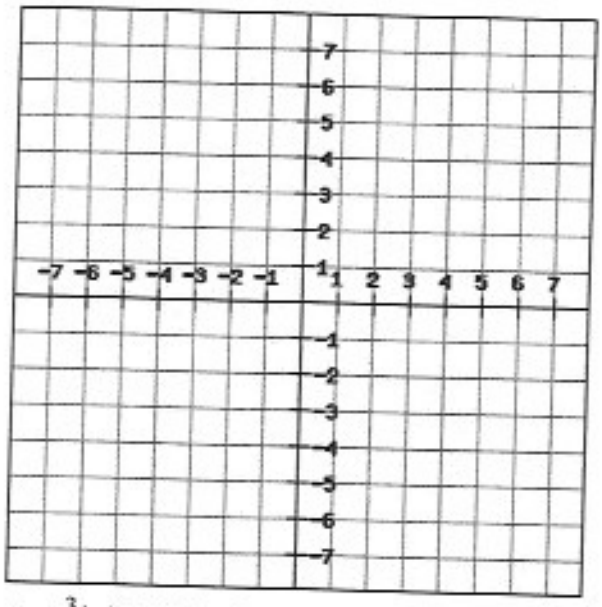
4) $y = {}^{-3}/_{4}\,|-4x-8| + 1$



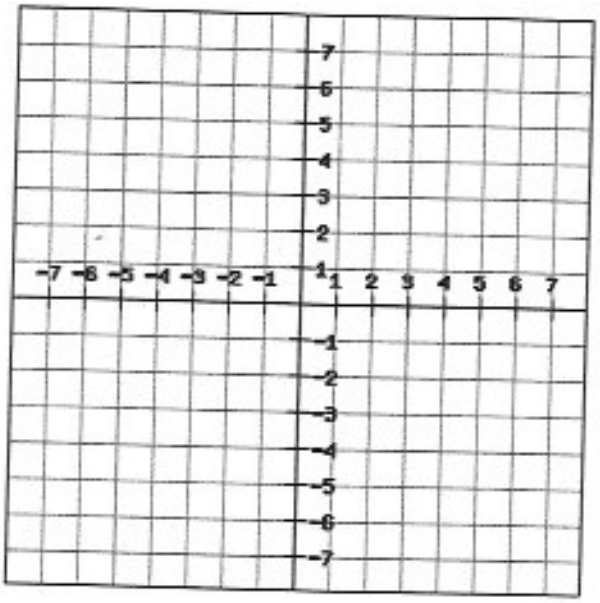
5) $y = {}^{-1}/_{6}\,|-6x-18|$



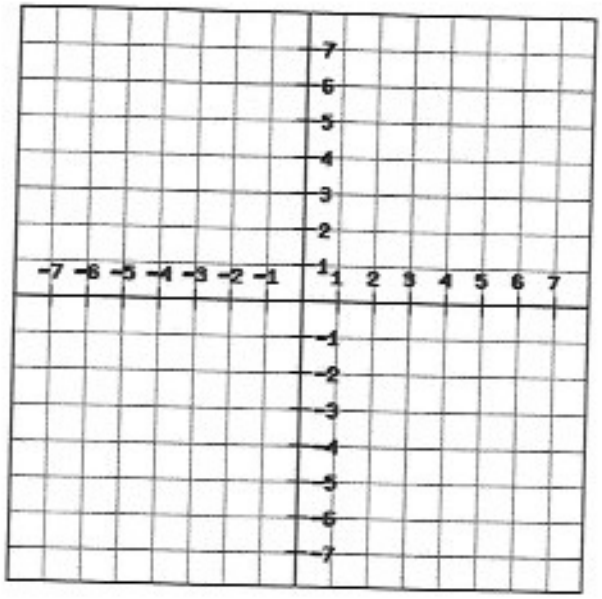
6) $y = {}^{-2}/_{7}\,|7x| + 2$



7) $y = {}^{-1}/_{2}\,|6x-18| - 1$



8) $y = {}^{-3}/_{7}\,|7x+28| + 3$



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Summer Math AQR/ Calculus Page 4 Factoring Trinomials a = 1

Name:_____

Period: _____ Date: _____

Factor:

1) $d^2 + 7d + 12$

2) $d^2 + 7d + 10$

3) $t^2 + 5t + 6$

4) $h^2 - 9$

5) $-5v^9 + 50v^8 - 125v^7$

6) $3n^6 + 18n^5 + 27n^4$

7) $w^2 - 16$

8) $-d^7 - 4d^6 - 4d^5$

9) $4c^5 + 16c^4 + 16c^3$

10) $q^2 - 2q - 8$

Teacher/User Name: L. Taylor

Summer Math AQR/ Calculus Page 5 Factoring Trinomials a > 1

Name:_____

Period: _____ Date: _____

Factor:

1) $2c^2 + 7c - 4$

2) $27y^4 - 9y^3 - 60y^2$

3) $c^2 - 1$

4) $5k^2 - 9k + 4$

5) $12n^3 - 22n^2 + 6n$

6) $5k^2 + 9k + 4$

7) $3n^2 + 11n + 6$

8) $4p^2 + p - 5$

9) $n^2 - 7n + 10$

10) $p^2 - 4p + 4$

Teacher/User Name: L. Taylor

Summer Math AQR/ Calculus Page 6 Add and Sub Matrices

Name:_____

Period: _____ Date: _____

Solve

1) $7\begin{bmatrix} 1 & -2 \\ -5 & -7 \\ 7 & -3 \end{bmatrix} -4\begin{bmatrix} 1 & 5 \\ 2 & -4 \\ -5 & 5 \end{bmatrix} =$

2) $5\begin{bmatrix} -9 & 8 \\ 1 & 4 \end{bmatrix} -2\begin{bmatrix} 8 & -1 \\ -3 & -6 \end{bmatrix} =$

3) $-5\begin{bmatrix} 7 & -10 & 0 \\ -5 & -10 & -4 \\ -4 & -2 & 0 \end{bmatrix} -6\begin{bmatrix} -4 & 9 & -5 \\ -7 & 4 & -4 \\ 8 & -2 & 8 \end{bmatrix} =$

4) $9\begin{bmatrix} 0 & -3 & -1 & 6 \\ -9 & 7 & 1 & 5 \\ 6 & -9 & 2 & 7 \\ -8 & 4 & 8 & -7 \end{bmatrix} -4\begin{bmatrix} -10 & 5 & 1 & 2 \\ 5 & -1 & -7 & 3 \\ 8 & 7 & 1 & -7 \\ 6 & 0 & -10 & 8 \end{bmatrix} =$

5) $-9\begin{bmatrix} -4 & -4 \end{bmatrix} -7\begin{bmatrix} -9 & 0 \end{bmatrix} =$

6) $-3\begin{bmatrix} 5 & 2 & -5 & 0 \end{bmatrix} +9\begin{bmatrix} -2 & 1 & 1 & 2 \end{bmatrix} =$

7) $-6\begin{bmatrix} 2 & 8 \end{bmatrix} +1\begin{bmatrix} -4 & 7 \end{bmatrix} =$

8) $2\begin{bmatrix} -1 & -1 \\ 2 & 7 \end{bmatrix} +2\begin{bmatrix} -2 & 5 \\ -4 & 3 \end{bmatrix} =$

9) $-5\begin{bmatrix} -7 & -9 & 1 \\ 4 & -1 & 1 \end{bmatrix} -\begin{bmatrix} -4 & -8 & 9 \\ -1 & 6 & -10 \\ 5 & 1 & -1 \end{bmatrix} =$

10) $-4\begin{bmatrix} -9 \\ -10 \\ -10 \\ 5 \end{bmatrix} -\begin{bmatrix} -8 \\ 2 \\ -3 \\ -8 \end{bmatrix} =$

Teacher/User Name: L. Taylor

Summer Math AQR/ Calculus Page 7 Matrix Word Problems

Name:_____

Period: _____ Date: _____

Solve:

1) The monthly payment for a computer loan depends upon the annual interest rate, the amount of the loan, and the length of the loan. The matrix shows different monthly payments (in hundreds of dollars) for a loan. The amounts of the loans are listed as rows: $21,000, $15,000, $5,000 in order. The time in years, 6 years, 20 years, 3 years are listed in the columns. If you are given the following matrix, what is the monthly payment for a loan of $5,000 taken out for 3 years?

$$\begin{bmatrix} 2 & 1 & 7 \\ 4 & 8 & 2 \\ 8 & 4 & 9 \end{bmatrix}$$

2) The monthly payment for a car loan depends upon the annual interest rate, the amount of the loan, and the length of the loan. The matrix shows different monthly payments (in hundreds of dollars) for a loan. The amounts of the loans are listed as rows: $14,000, $8,000, $5,000 in order. The time in years, 20 years, 9 years, 10 years are listed in the columns. If you are given the following matrix, what is the monthly payment for a loan of $8,000 taken out for 10 years?

$$\begin{bmatrix} 9 & 7 & 1 \\ 1 & 6 & 1 \\ 5 & 2 & 4 \end{bmatrix}$$

3) The monthly payment for a boat loan depends upon the annual interest rate, the amount of the loan, and the length of the loan. The matrix shows different monthly payments (in hundreds of dollars) for a loan. The amounts of the loans are listed as rows: $2,000, $13,000, $19,000 in order. The time in years, 7 years, 5 years, 9 years are listed in the columns. If you are given the following matrix, what is the monthly payment for a loan of $19,000 taken out for 5 years?

$$\begin{bmatrix} 6 & 10 & 2 \\ 4 & 6 & 3 \\ 5 & 4 & 3 \end{bmatrix}$$

4) The Simple Company has 3 products: caps, shirts, and pants. All three types are made with different amounts of fabric sheets, spools of thread, and cases of dye. Caps are made with 2 fabric sheets, 5 spools of thread, and 8 cases of dye. Shirts are made with 7 fabric sheets, 11 spools of thread, and 6 cases of dye. Pants are made with 5 fabric sheets, 10 spools of thread, and 8 cases of dye. If fabric sheets costs $9, spools of thread costs $8, and cases of dye costs $5, what is the cost of each of the three products?

5) The David Inc Company has 3 products: wiggles, woggles, and waggles. All three types are made with different amounts of caps, kits, and cots. Wiggles are made with 11 caps, 10 kits, and 7 cots. Woggles are made with 10 caps, 3 kits, and 8 cots. Waggles are made with 5 caps, 3 kits, and 4 cots. If caps costs $11, kits costs $11, and cots costs $2, what is the cost of each of the three products?

6) The David Inc Company has 3 products: cereals, breads, and trail mix. All three types are made with different amounts of cups of wheat, cups of corn, and cups of rice. Cereals are made with 5 cups of wheat, 6 cups of corn, and 2 cups of rice. Breads are made with 2 cups of wheat, 2 cups of corn, and 3 cups of rice. Trail mix are made with 7 cups of wheat, 6 cups of corn, and 11 cups of rice. If cups of wheat costs $2, cups of corn costs $7, and cups of rice costs $8, what is the cost of each of the three products?

7) The monthly payment for a boat loan depends upon the annual interest rate, the amount of the loan, and the length of the loan. The matrix shows different monthly payments (in hundreds of dollars) for a loan. The amounts of the loans are listed as rows: $17,000, $2,000, $13,000 in order. The time in years, 14 years, 15 years, 3 years are listed in the columns. If you are given the following matrix, what is the monthly payment for a loan of $13,000 taken out for 15 years?

$$\begin{bmatrix} 4 & 6 & 3 \\ 1 & 5 & 3 \\ 4 & 9 & 6 \end{bmatrix}$$

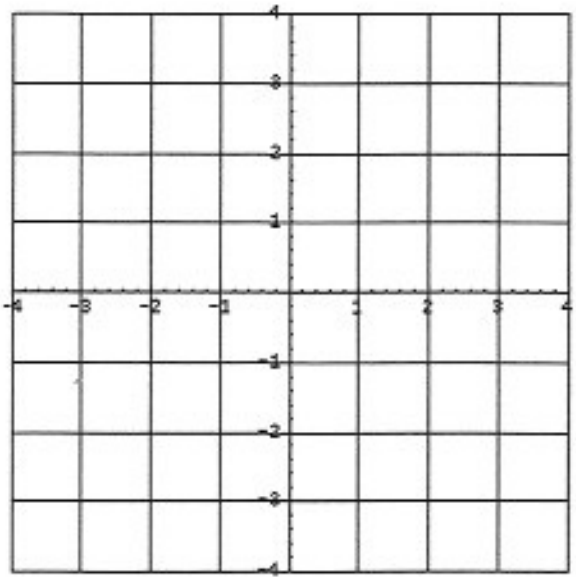
8) The Imaginary City Company has 3 products: wiggles, woggles, and waggles. All three types are made with different amounts of caps, kits, and cots. Wiggles are made with 9 caps, 4 kits, and 9 cots. Woggles are made with 10 caps, 4 kits, and 7 cots. Waggles are made with 5 caps, 7 kits, and 8 cots. If caps costs $8, kits costs $7, and cots costs $7, what is the cost of each of the three products?

Name:_____
Period: _____ Date: _____

Simplify:

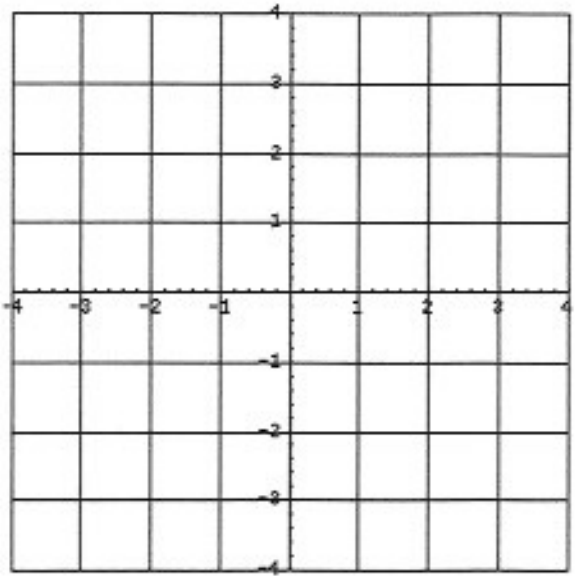
1) Graph:

$$n(x) = \begin{cases} x^2 - 2x + 3 \; ; \; x > 0 \\ -\frac{1}{2}x \quad ; \; x \leq 0 \end{cases}$$



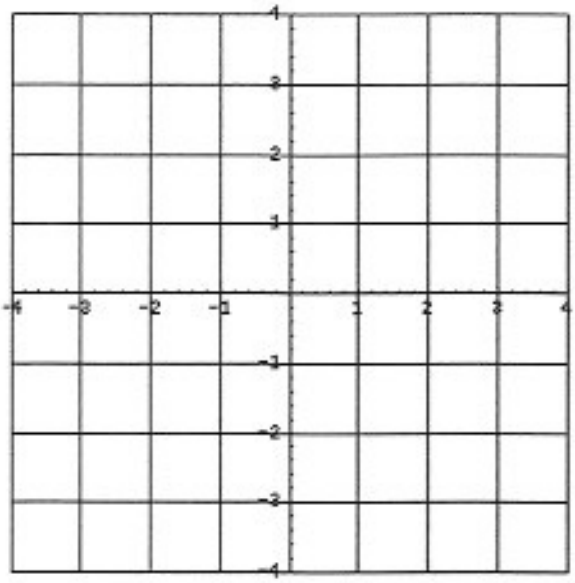
2) Graph:

$$t(x) = \begin{cases} 2x^2 - 4x \; ; \; x \geq -1 \\ x + 1 \quad ; \; x < -1 \end{cases}$$



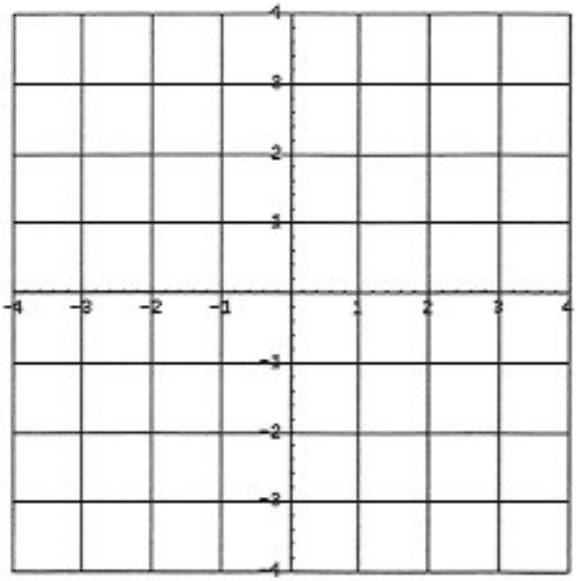
3) Graph:

$$t(x) = \begin{cases} x + 1 & ; x < -1 \\ {}^{1}/_{2}\,x - {}^{5}/_{2} & ; x \geq -1 \end{cases}$$



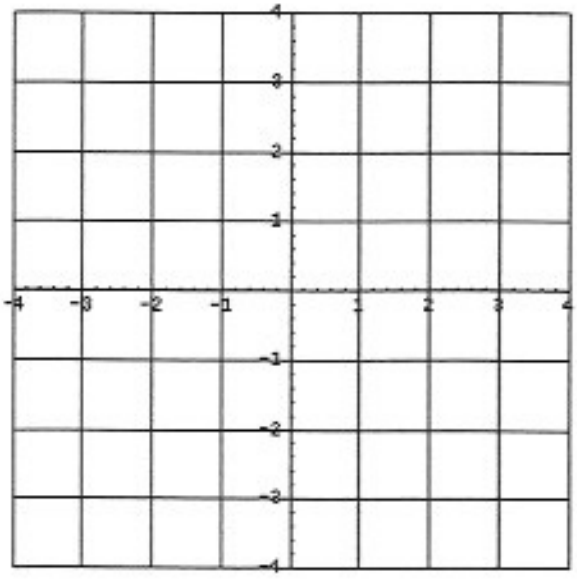
4) Graph:

$$e(x) = \begin{cases} -2x - 3 & ; x \leq -2 \\ x & ; x > -2 \end{cases}$$



5) Graph:

$$z(x) = \begin{cases} -x^2 - 6x - 10 & ; x < -3 \\ -2x - 6 & ; x \geq -3 \end{cases}$$



6) Graph:

$$e(x) = \begin{cases} 2x^2 + 8x + 8 & ; x \geq -3 \\ -3x^2 - 18x - 24 & ; x < -3 \end{cases}$$