

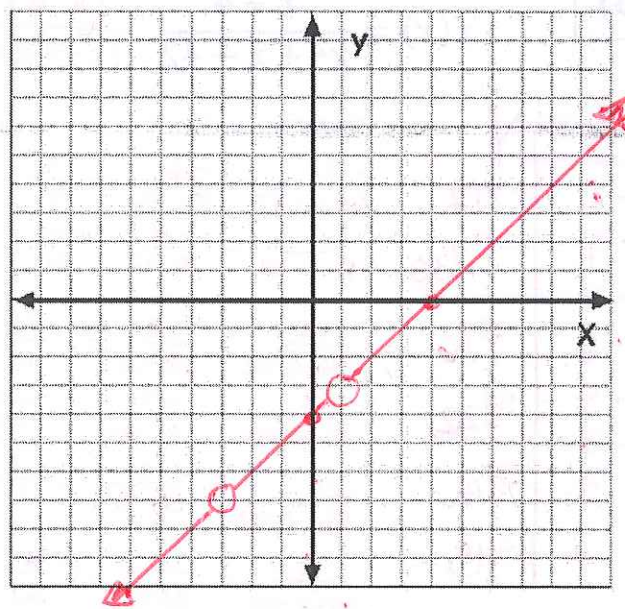
Section 1: Find any discontinuities, then graph. Show ALL work!

1)

$$f(x) = \frac{(x+3)(x^2 - 5x + 4)}{x^2 + 2x - 3}$$

$$\frac{(x+3)(x-4)(x-1)}{(x+3)(x-1)}$$

$$f(x) = x - 4$$



Domain: $(-\infty, -3) \cup (-3, 1) \cup (1, \infty)$

Hole(s): $(1, -3), (-3, -7)$

V.A.(s): none

H.A.: none

S.A.: none

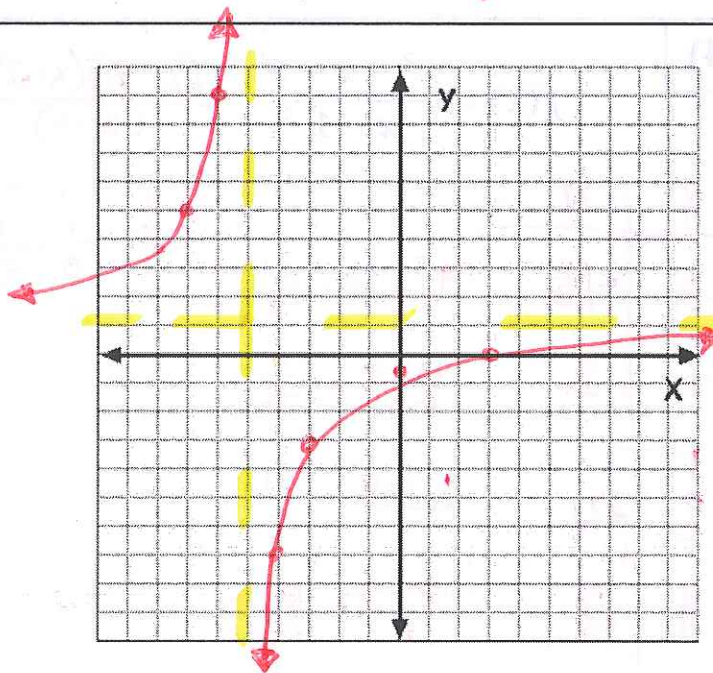
x-int(s): $(4, 0)$

y-int: $(0, -4)$

2)

$$f(x) = \frac{x-3}{x+5}$$

x	y	
-3	-3	$-\frac{6}{2}$
-4	-7	$-\frac{7}{1}$
-5		
-6	9	$-\frac{9}{-1}$
-7	5	$-\frac{10}{-2}$



Domain: $(-\infty, -5) \cup (-5, \infty)$

Hole(s): (none)

V.A.(s): $x = -5$

H.A.: $y = 1$

S.A.: none

x-int(s): $(3, 0)$

y-int: $(0, -3/5)$

Algebra 2/Trigonometry
Unit 5 Review Packet

Section 1: Find any discontinuities, then graph. Show ALL work!

3)

$$f(x) = \frac{x-4}{x^2+x-42} \quad \frac{(x-4)}{(x+7)(x-6)}$$

X	Y
-8	-6/7
-9	-13/30
-7	
-6	5/6
-5	9/22
-4	
-3	3/14
-2	2/15

$$\frac{-12}{64-8-42} = \frac{-12}{56-42} = \frac{-12}{14}$$

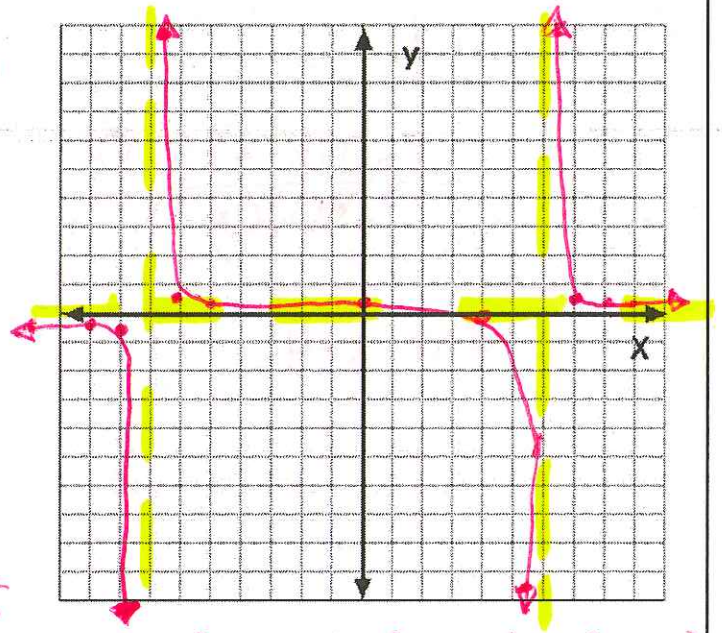
$$\frac{-13}{81-9-42} = \frac{-13}{72-42} = \frac{-13}{30}$$

$$\frac{-10}{36-6-42} = \frac{-10}{30-42} = \frac{-10}{-12}$$

$$\frac{-9}{25-5-42} = \frac{-9}{20-42} = \frac{-9}{-22}$$

$$\frac{3}{49+7-42} = \frac{3}{56-42} = \frac{3}{14}$$

$$\frac{4}{64+8-42} = \frac{4}{72-42} = \frac{4}{30} = \frac{2}{15}$$



Domain: $(-\infty, -7) \cup (-7, 6) \cup (6, \infty)$

Hole(s): none

V.A.(s): $x = -7$ $x = 6$

H.A.: $y = 0$

S.A.: none

x-int(s): $(4, 0)$

y-int: $(0, 2/21)$

4)

$$f(x) = \frac{x^2-x-6}{x-1} \quad \frac{(x-3)(x+2)}{(x-1)}$$

X	Y
-3	-1 1/2
-1	2
1	
2	-4
4	2

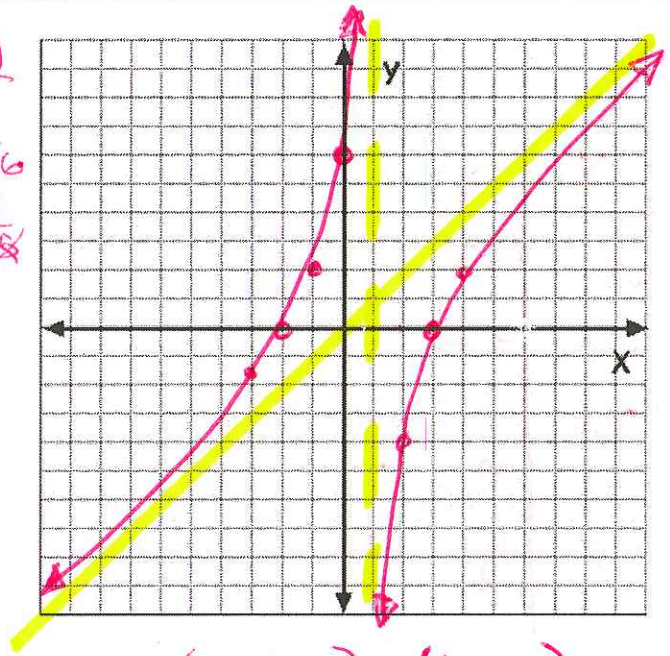
$$\frac{9+3-6}{-4} = \frac{6}{-4}$$

$$\frac{1+1-6}{-2} = \frac{-4}{-2}$$

$$\frac{4-2-6}{1} = -4$$

$$\frac{16+4-6}{3} = \frac{14}{3}$$

$$\begin{array}{r} 1 - 1 - 6 \\ \underline{1 0 - 6} \\ 0 0 0 \end{array}$$



Domain: $(-\infty, 1) \cup (1, \infty)$

Hole(s): none

V.A.(s): $x = 1$

H.A.: none

S.A.: $y = x$

x-int(s): $(3, 0)$ $(-2, 0)$

y-int: $(0, 6)$

Algebra 2/Trigonometry
Unit 5 Review Packet

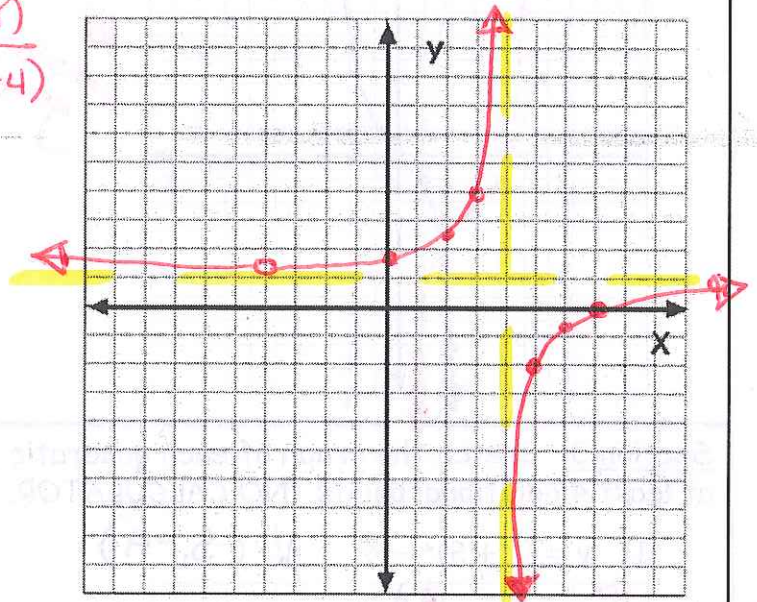
Section 1: Find any discontinuities, then graph. Show ALL work!

5)

$$f(x) = \frac{x^2 - 3x - 28}{x^2 - 16} \quad \frac{(x-7)(x+4)}{(x+4)(x-4)}$$

$$f(x) = \frac{x-7}{x-4}$$

X	Y
3	4 $-\frac{4}{-1} = \frac{4}{1}$
2	$2\frac{1}{2}$ $-\frac{5}{-2} = \frac{5}{2}$
4	
5	-2 $-\frac{2}{1} = -2$
6	$-1\frac{1}{2}$ $-\frac{11}{-8} = \frac{11}{8} = 1\frac{3}{8}$



Domain: $(-\infty, -4) \cup (-4, 4) \cup (4, \infty)$

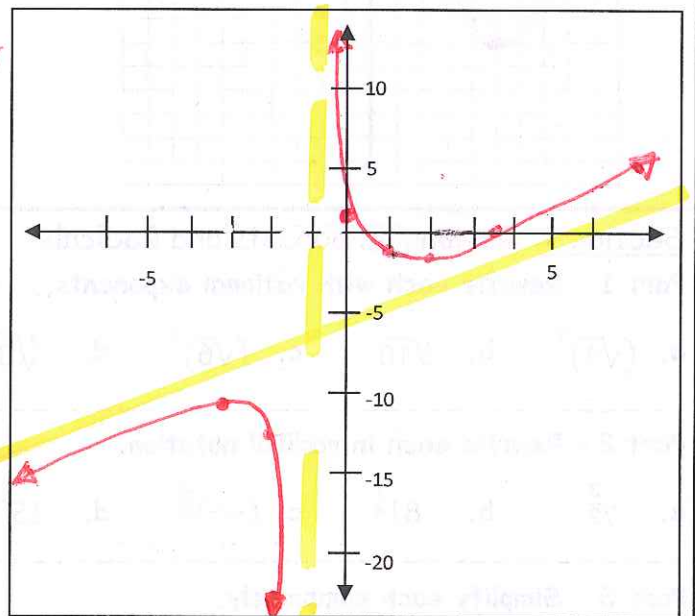
Hole(s): $(4, 3/4)$ V.A.(s): $x=4$ H.A.: $y=1$
S.A.: none x-int(s): $(7, 0)$ y-int: $(0, 7/4) = 1\frac{3}{4}$

6)

$$f(x) = \frac{x^2 - 4x + 1}{x + 1}$$

$$\frac{4 \pm \sqrt{16 - 4(1)(1)}}{2(1)} = \frac{4 \pm \sqrt{12}}{2} = \frac{4 \pm 2\sqrt{3}}{2} = 2 \pm \sqrt{3}$$

X	Y
-3	-11 $\frac{12+1}{-2} = -\frac{13}{2} = -6.5$
-2	-13
-1	
1	-1
2	-1

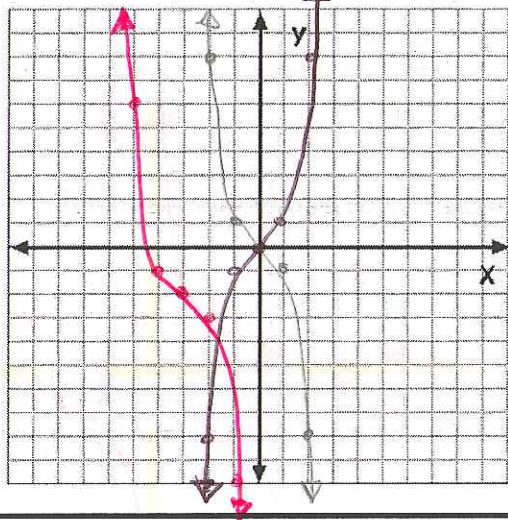


Domain: $(-\infty, -1) \cup (-1, \infty)$

Hole(s): none V.A.(s): $x=-1$ H.A.: none
S.A.: $y=x-5$ x-int(s): $(2+\sqrt{3}, 0)$ $(2-\sqrt{3}, 0)$ y-int: $(0, 1)$
 ≈ 3.7 ≈ 0.3

Section 2: Using parent graphs, sketch each transformation. NO CALCULATOR.

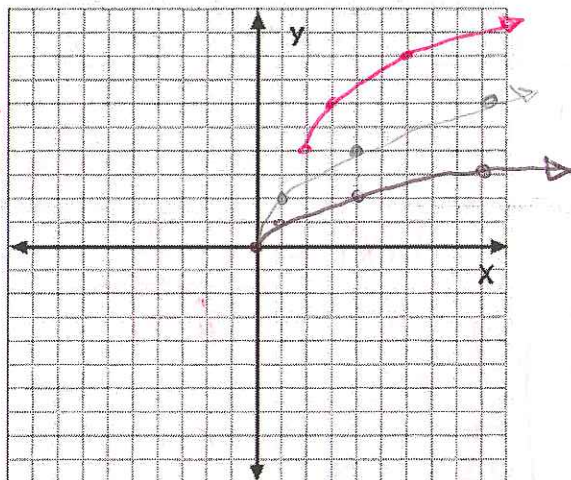
1) $y = -(x + 3)^3 - 2$



parent graph

transformed graph

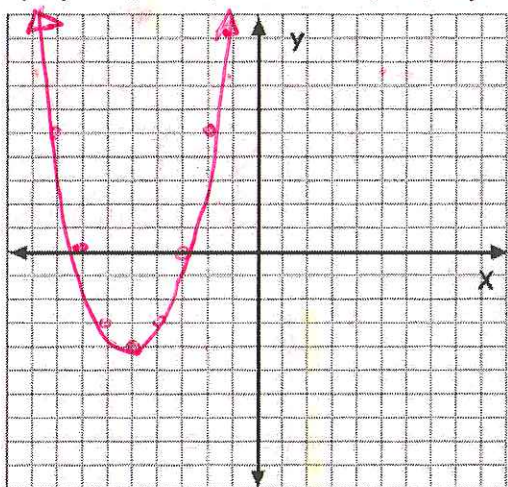
2) $y = 2\sqrt{x - 2} + 4$



Section 3: Sketch the graph of each quadratic function. You must identify the vertex and at least 4 additional points. NO CALCULATOR.

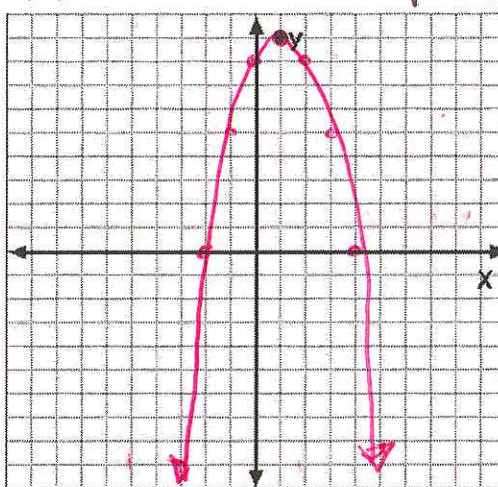
1) $y = (x + 5)^2 - 4$

$V: (-5, -4)$



2) $y = -x^2 + 2x + 8$

$V: (1, 9)$



Section 4: Rational Exponents and Radicals

Part 1 - Rewrite each with rational exponents.

a. $(\sqrt{4})^5$ b. $\sqrt[5]{10}$ c. $(\sqrt{6})^3$ d. $\sqrt[3]{8^2}$

Part 2 - Rewrite each in radical notation.

a. $7^{\frac{3}{2}}$ b. $81^{\frac{1}{4}}$ c. $(-5)^{\frac{3}{5}}$ d. $15^{-\frac{1}{3}}$

Part 3 - Simplify each completely.

a. $125^{\frac{2}{3}}$ b. $(-32)^{\frac{3}{5}}$ c. $4^{\frac{8}{3}} \cdot 4^{\frac{4}{3}}$ d. $2^4 \cdot 2^{-1} \cdot 2^{-3}$

e. $\sqrt{36x^5y^8z^{10}}$ f. $\sqrt{24x^3y^6z^5}$ g. $\sqrt[3]{48x^4y^2z^5}$ h. $\sqrt[4]{9x^3y^4z^5}$

Section 5: Solve each equation by taking the nth root. Be sure to check your solutions. Round any decimal answers to the nearest hundredths.

1) $2x^3 = 512$ 5) $(x - 7)^4 = 256$

2) $(x - 3)^5 = -32$ 6) $3x^3 - 2 = 574$

3) $4x^{\frac{3}{4}} = 108$ 7) $(x - 4)^{\frac{3}{2}} - 8 = 0$

4) $x^{\frac{4}{3}} + 9 = 25$ 8) $2(2x + 5)^{\frac{1}{2}} = 8$

see attached

*(Section 4)

Part 1

a) $(\sqrt{4})^8$
 $4^{5/2}$
 16

b) $\sqrt[5]{10}$
 $10^{1/5}$

c) $(\sqrt{6})^3$
 $6^{3/2}$

d) $\sqrt[3]{8^2}$
 $8^{2/3}$

Part 2

a) $7^{3/2}$
 $(\sqrt{7})^3$

b) $81^{1/4}$
 $\sqrt[4]{81}$

c) $(-5)^{3/5}$
 $(\sqrt[5]{-5})^3$

d) $15^{-1/3}$
 $\frac{1}{\sqrt[3]{15}}$

Part 3

a) $125^{2/3}$
 $(\sqrt[3]{125})^2$
 5^2
 25

b) $(-32)^{3/5}$
 $(\sqrt[5]{-32})^3$
 $(-2)^3$
 -8

c) $4^{8/3} \cdot 4^{4/3}$
 $4^{8/3+4/3}$
 $4^{12/3} = 4^4$
 256

d) $2^4 \cdot 2^{-1} \cdot 2^{-3}$
 2^{4-1-3}
 2^0
 1

e) $\sqrt{36x^5y^8z^{10}}$
 $6x^2y^4z^5\sqrt{x}$

f) $\sqrt[3]{24x^3y^6z^5}$
 $2xy^2\sqrt[3]{6xz^5}$

g) $\sqrt[3]{48x^4y^2z^5}$
 $2xz\sqrt[3]{6xy^2z^2}$

h) $\sqrt[4]{9x^3y^4z^5}$
 $yz\sqrt[4]{9x^3z}$

*(Section 5)

1) $2x^3 = 512$
 $\sqrt[3]{x^3} = \sqrt[3]{256}$
 $x = 4\sqrt[3]{4}$

2) $\sqrt[5]{(x-3)^5} = \sqrt[5]{-32}$
 $x-3 = -2$
 $x = 1$

3) $4x^{3/4} = 108$
 $x^{3/4} = 27$
 $x = (27)^{4/3}$
 $x = 3^4 = 81$

4) $x^{4/3} + 9 = 25$
 $(x^{4/3})^{3/4} = (16)^{3/4}$
 $x = (\sqrt[4]{16})^3$
 $x = 2^3 = 8$

5) $\sqrt[4]{(x-7)^4} = \sqrt[4]{256}$
 $x-7 = \pm 4$
 $x = 7 \pm 4$
 $x = 11, 3$

(-7)

*(Section 5)

$$6) 3x^3 - 2 = 574$$

$$3x^3 = 576$$

$$x^3 = 192$$

$$x = 4 \sqrt[3]{3}$$

$$7) (x-4)^{3/2} - 8 = 0$$

$$(x-4)^{3/2} = 8$$

$$x-4 = (\sqrt[3]{8})^2$$

$$x-4 = 4$$

$$x = 8$$

$$8) 2(2x+5)^{1/2} = 8$$

$$(2x+5)^{1/2} = 4$$

$$2x+5 = 16$$

$$2x = 11$$

$$x = 5.5$$