Algebra 2

	Day	Date	Video	Assignment Due	Is it done?
19	Tuesday	4/14/2020	practice test	practice test chapter 9	
20	Wednesday	4/15/2020		take test	
21	Thursday	4/16/2020	10.1		
22	Friday	4/17/2020	10.2	422: 1-24	
23	Monday	4/20/2020	10.3	428: 1-18, graph evens	
24	Tuesday	4/21/2020		433: 1-18 odd	
25	Wednesday	4/22/2020		433: 1-18 even	
26	Thursday	4/23/2020	practice quiz	practice quiz 10.1-3	
27	Friday	4/24/2020		take quiz	
28	Monday	4/27/2020	10.4		
29	Tuesday	4/28/2020		441: 1-20 odd	
30	Wednesday	4/29/2020	10.5	441: 1-20 even	
31	Thursday	4/30/2020		447: 1-24, graph odd	
32	Friday	5/1/2020	practice quiz	practice quiz 10.4-5	
	Monday	5/4/2020		quiz	
	How many total did you do:				

Zoom session happen Mon/Wed/Fri at 2:30 for those needing any help

Name _____ Test, Algebra 2, Chapter 9

Is the figure symmetric to the given line and to the given point? Answer yes or no. (3)

1. 

2. 

3. 

Test for symmetry to the x-axis and the y-axis. Answer yes or no. (3)

4. $3x^3 + 4y^2 = 6$

5. $2x + 5y^4 = 7$

6. $3x = 4y^2$

Test for symmetry with respect to the origin. Answer yes or no. (2)

7. $3x = 6y$

8. $4x = 5y^2$

Determine whether each function is even, odd, or neither. (4)

9. $f(x) = x^9$

10. $f(x) = x^4 + x^2$

11. $f(x) = x^8 + x$

12. $f(x) = 7$

Tell how the graph of f(x) would be transformed. (10)

13. -6 + f (x) _____

14. f (x - 4) _____

15. 5 f (x) _____

16. f (6x) _____

17. 5 + 3 f (x) _____

18. -4 f (x) _____

19. f (-5x) _____

20. -6 + f (x - 3) _____

21. 7 - 3 f (x) _____

22. 5 f (x + 4) _____

Graph on graph paper. (8)

23. $y = -|x|$

24. $y = |x+2|$

25. $y = 4 + \frac{1}{2}|x|$

26. $y = 2x^2$

27. $y = -(x-2)^2$

28. $y = -3 + (x+5)^2$

29. $f(-\frac{1}{2}x)$

30. $2f(x)$

Find the vertex, line of symmetry, and the max or min. (10)

31. $f(x) = (x+2)^2 + 4$ _____ _____ _____

32. $f(x) = 6(x-8)^2 - 1$ _____ _____ _____

33. $f(x) = -3(x-5)^2 - 7$ _____ _____ _____

34. $f(x) = -(x-9)^2 + 8$ _____ _____ _____

35. $f(x) = 7(x+6)^2 - 5$ _____ _____ _____

36. $f(x) = -(x+4)^2 - 3$ _____ _____ _____

37. $f(x) = -2(x-1)^2 + 2$ _____ _____ _____

38. $f(x) = 3(x+4)^2 + 5$ _____ _____ _____

39. $f(x) = -(x+6)^2 - 7$ _____ _____ _____

40. $f(x) = (x-8)^2 + 9$ _____ _____ _____

Complete the squareto get an equation in the form f (x) = a (x - h) ^{2} + k. (5)

41. $f(x) = x^2 + 3x + 5$ _____

42. $f(x) = x^2 + 4x - 7$ _____

43. $f(x) = -x^2 - 5x + 4$ _____

44. $f(x) = -2x^2 - 8x + 6$ _____

45. $f(x) = -3x^2 + 3x + 5$ _____

Find the x-intercepts. (5)

46. $f(x) = x^2 - 6x + 7$ _____

47. $f(x) = x^2 + 2x + 2$ _____

48. $f(x) = x^2 - 2x + 1$ _____

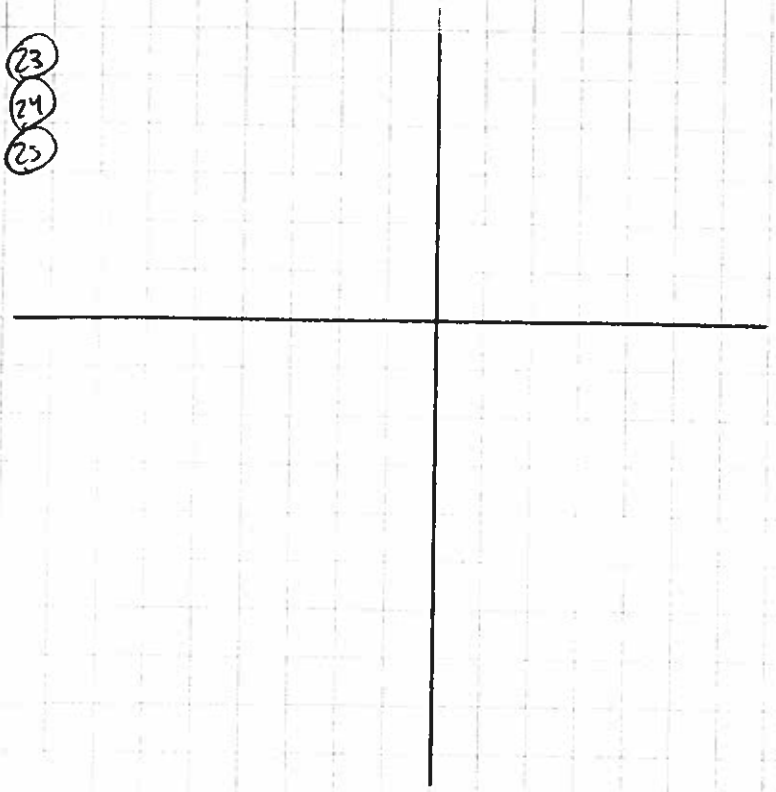
49. $f(x) = 4x^2 + 8x + 3$ _____

50. $f(x) = 3x^2 + 4x - 4$ _____

NAME

ALG 2, CH 9 TEST

(23)
(24)
(25)



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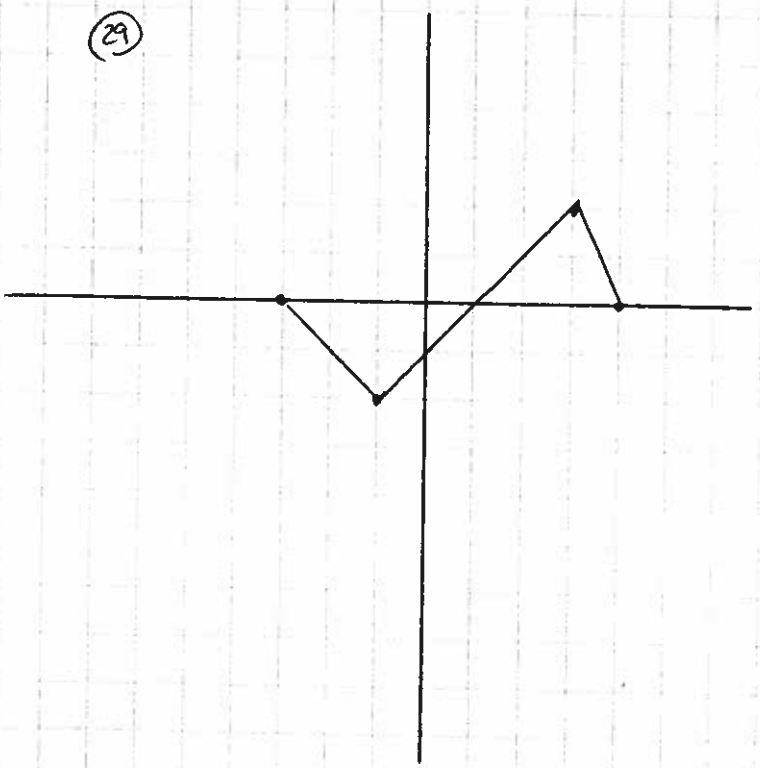

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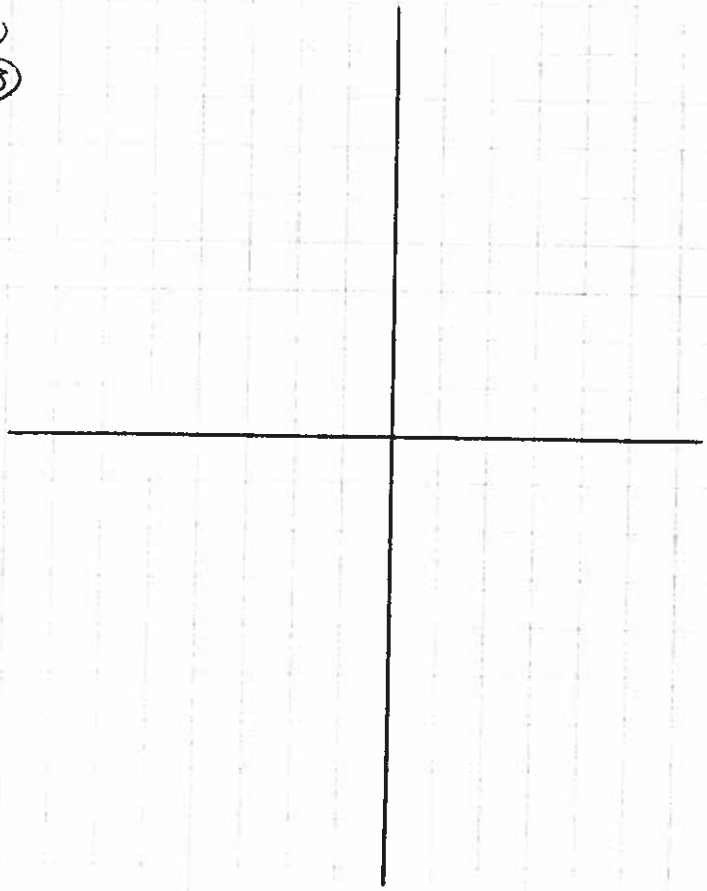

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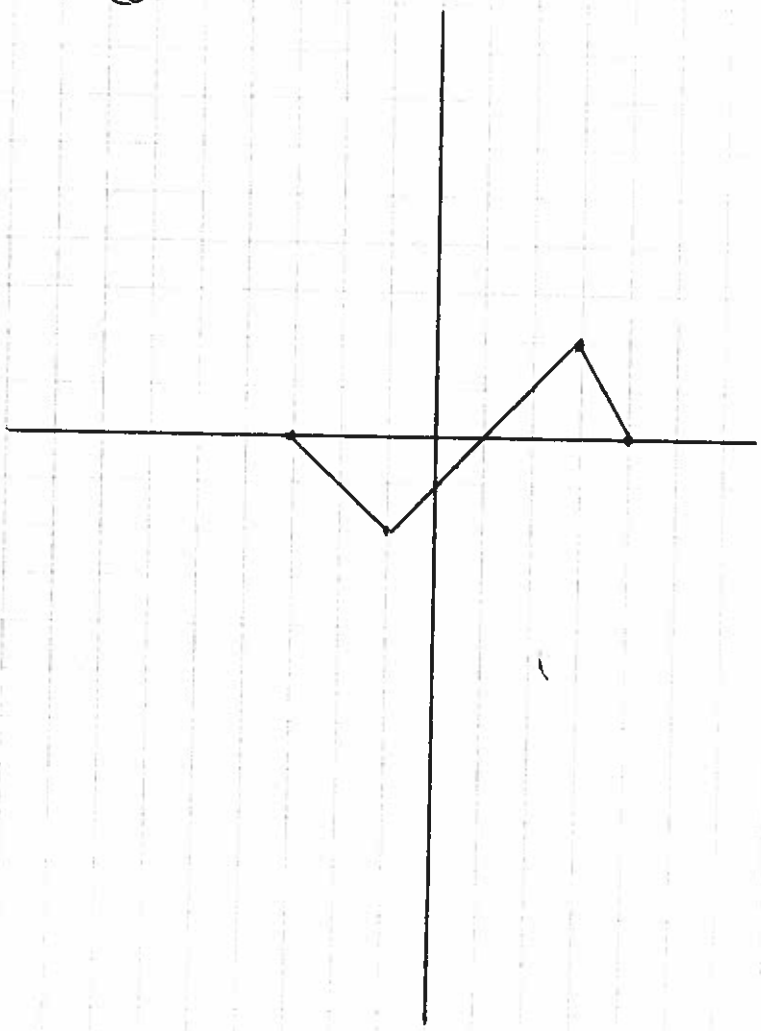


10.1

DISTANCE FORMULA

FOR (x_1, y_1) AND (x_2, y_2) THE DISTANCE BETWEEN THEM IS $\sqrt{(x_1-x_2)^2 + (y_1-y_2)^2}$

1. SUBTRACT x'S AND SUBTRACT y'S TO GET 2 #'S
2. SQUARE BOTH
3. ADD
4. ROOT

FOR (2, 3) AND (5, 7)

1. SUBTRACT	$2-5=-3$		$3-7=-4$
2. SQUARE		9	16
3. ADD	25		
4. ROOT	5		

FOR (1, -3) AND (5, -5)

1. SUBTRACT	$1-5=-4$		$-3--5=2$
2. SQUARE		16	4
3. ADD		20	
4. ROOT		$2\sqrt{5}$	

FOR (5a, 6b) AND (7a, 11b)

1.	$2a$	$5b$
2.	$4a^2$	$25b^2$
3.	$4a^2+25b^2$	
4.	$\sqrt{4a^2+25b^2}$	

MIDPOINT FORMULA

FOR (x_1, y_1) AND (x_2, y_2) THE MIDPOINT OR HALF WAY POINT IS $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$

1. ADD x'S AND ADD y'S TO GET 2 #'S
2. DIVIDE BY 2

FOR $(2,3)$ AND $(5,7)$ ① $2+5=7$ $3+7=10$
② $\left(\frac{7}{2}, 5\right)$

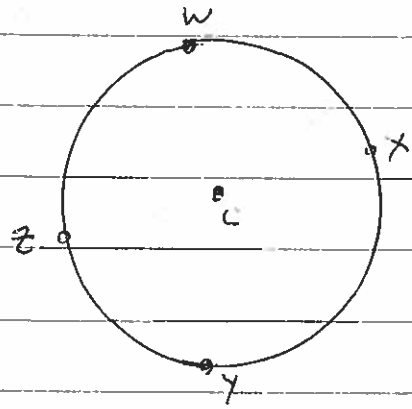
FOR $(-2,3)$ AND $(4,-5)$ ① $-2+4=2$ $3+-5=-2$
② $(1,-1)$

DO 422: 1-24

ALGEBRA 2, 10.2 NOTES

A CIRCLE IS THE SET of ALL POINTS IN A PLANE EQUIDISTANT FROM THE CENTER.

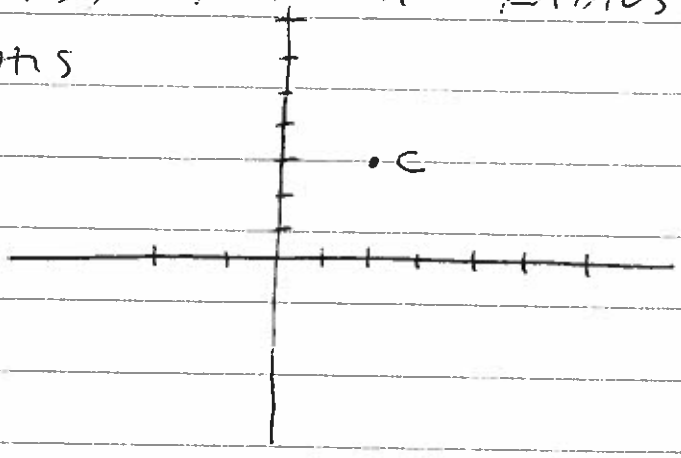
THAT DISTANCE IS CALLED THE RADIUS



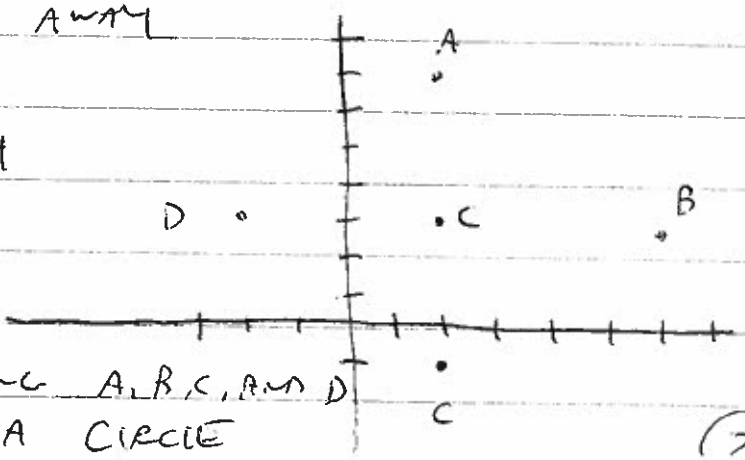
POINT C IN THE PICTURE ABOVE IS THE CENTER. POINTS W, X, Y, AND Z ARE ALL THE SAME DISTANCE FROM C. ANY OTHER POINT ON THE CIRCLE WOULD ALSO BE THE SAME DISTANCE AWAY. THE RADIUS FOR THE PICTURE ABOVE IS A LITTLE LESS THAN 1 INCH.

TO GRAPH A CIRCLE, FIRST GRAPH THE CENTER. THEN MAKE 4 POINTS THAT SURROUND THE CENTER - TO THE RIGHT, TO THE LEFT, DIRECTLY ABOVE, AND DIRECTLY BELOW. CONNECT THOSE 4 CAREFULLY TO FORM A CIRCLE

FOR A CIRCLE WITH A CENTER AT (2, 3) AND A RADIUS OF 4, DO THIS FIRST



THEN FROM C, MAKE 4 POINTS EACH 4 SPACES AWAY BECAUSE THE RADIUS IS 4



CAREFULLY CONNECTING A, B, C, AND D SHOULD CREATE A CIRCLE

IF A CIRCLE HAS ITS CENTER AT THE ORIGIN AND A RADIUS OF r, ITS EQUATION IS $x^2 + y^2 = r^2$

TO WRITE AN EQUATION WITH RADIUS 3, IT WOULD BE $x^2 + y^2 = 9$ (SINCE $3^2 = 9$)

FOR RADIUS 7, IT IS $x^2 + y^2 = 49$

FOR RADIUS $\sqrt{11}$, IT IS $x^2 + y^2 = 11$ (SINCE $(\sqrt{11})^2 =$ NORMAL 11)

TO WORK IN THE OTHER DIRECTION, DO THE OPPOSITE - DO THE $\sqrt{\ }$

IF $x^2 + y^2 = 25$, THE RADIUS IS 5 (SINCE $\sqrt{25} = 5$)

IF $x^2 + y^2 = 10$, THE RADIUS IS $\sqrt{10}$

IF $x^2 + y^2 = 20$, THE RADIUS IS $2\sqrt{5}$ ($\sqrt{20} \to \sqrt{4}\sqrt{5} \to 2\sqrt{5}$)

IF THE CENTER IS AT ANOTHER LOCATION LIKE (a,b), THE EQUATION WILL BE

$$(x-a)^2 + (y-b)^2 = r^2$$

IF THE CENTER IS $(2,3)$ WITH A RADIUS OF 4, WE GET

$$(x-2)^2 + (y-3)^2 = 16$$

IF CENTER IS $(-2,-3)$ WITH THE SAME RADIUS, WE DO

$$(x+2)^2 + (y+3)^2 = 16$$ (SINCE − − MAKES +)

IF I DO $(x+5)^2 + (y-6)^2 = 64$

CENTER IS $(-5,6)$ WITH RADIUS 8

IF I DO $(x-1)^2 + (y+3)^2 = 10$

CENTER IS $(1,-3)$ WITH RADIUS $\sqrt{10}$

IF THE EQUATION LOOKS LIKE $x^2 + y^2 + 8x - 2y + 15 = 0$, WE HAVE TO REMEMBER HOW TO FACTOR BY COMPLETING THE SQUARE.

PUT x's TOGETHER AND y's TOGETHER AND GET THE NUMBER OUT OF THERE TO HAVE

(A) $x^2 + 8x \quad + y^2 - 2y \quad = -15$

CUT 8 AND 2 IN HALF TO HAVE

(B) $(x+4)^2 + (y-1)^2$

SQUARE THE 4 AND THE 1 WE JUST CREATED TO GET 16 AND 1. THOSE FILL IN THE GAPS ON LINE (A) TO LOOK LIKE

$x^2 + 8x + \underline{16} + y^2 - 2y + \underline{1}$

BUT IF YOU ARE ADDING NUMBERS TO ONE SIDE, YOU HAVE TO ADD THEM TO THE OTHER LIKE

$$x^2 + 8x + 16 + y^2 - 2y + 1 = -15 + 16 + 1$$

THE TOTAL IS THEN

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

CENTER IS THEN $(-4, 1)$
RADIUS IS THEN $\sqrt{2}$

WORK ON PAGE 427: 1-18
GRAPH THE EVEN ONES

TO GRAPH SOMETHING LIKE $\sqrt{30}$, USE YOUR CALCULATOR TO DERIVE $\sqrt{30}$ IS ABOUT 5.5, A-2 THEN MOVE ABOUT 5,5 SQUARES

10.3

ELLIPSES

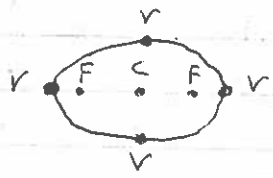
AN ELLIPSE IS THE SET OF ALL POINTS IN A PLANE, WHERE THE SUM OF 2 DISTANCES TO 2 POINTS, CALLED FOCI, IS CONSTANT

STANDARD FORM FOR AN ELLIPSE CENTERED AT (0,0) IS $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$

(NEEDS TO HAVE FRACTIONS AND BE = 1)

AN ELLIPSE IS AN OVAL SHAPE

IT HAS 4 POINTS CALLED VERTEXES,



2 FOCI,

1 CENTER

TO FIND VERTEXES, ROOT THE NUMBERS ON THE BOTTOM OF THE FRACTIONS

TO FIND FOCI, SUBTRACT AND ROOT THESE #'S

IF $9x^2 + 2y^2 = 18$, DIVIDE ALL BY 18 TO GET TO STANDARD FORM $\frac{x^2}{2} + \frac{y^2}{9} = 1$

CENTER	(0,0)
VERTEXES (ROOT 2, AND ROOT 9)	$(\sqrt{2},0)(-\sqrt{2},0)(0,3)(0,-3)$
FOCI (SUBTRACT AND ROOT)	$(0,\sqrt{7})(0,-\sqrt{7})$

$\sqrt{7}$ GOES 2ND BECAUSE y HAS A BIGGER # THAN x ($9 > 2$) AND y GOES 2ND $-(x,y)$

If $x^2 + 16y^2 = 16$ DIVIDE BY 16

$$\frac{x^2}{16} + \frac{y^2}{1} = 1$$

C : (0,0)
V : (4,0) (-4,0) (0,1) (0,-1)
F : $(\sqrt{15}, 0)$ $(-\sqrt{15}, 0)$

If you have something like
$16x^2 + 4y^2 + 96x - 8y + 84 = 0$
factor by completing the square

Group var. $16x^2 + 96x \quad + 4y^2 - 8y \quad = -84$
Factor GCF $16(x^2 + 6x \_\_\_) + 4(y^2 - 2y \_\_\_) = -84 \_\_\_ \_\_\_$
Pick squares $16(x+3)^2 + 4(y-1)^2 =$

Add in missing #'s above - After $+6x$, put $+9$ (because 3×3)
After $-2y$, put $+1$ ($(\times 1)$
After -84, put $+144$ (16 distributes to multiply 9)
After the $+144$, put $+4$ (4 distributes in to multiply 1)

$$16(x+3)^2 + 4(y-1)^2 = 64$$

Divide by 64

$$\frac{(x+3)^2}{4} + \frac{(y-1)^2}{16} = 1$$

(2,0) (-2,0) (0,4) (0,-4)
$(0, 2\sqrt{3})$ $(0, -2\sqrt{3})$

433 : 1-18

C : (-3,1)
Add on coordinates from center
V : (-1,1) (-5,1) (-3,5) (-3,-3)
f : $(-3, 2\sqrt{3}+1)$ $(-3, -2\sqrt{3}+1)$

Name _____ Practice Quiz, Algebra 2, 10.1-3

Find the distance between the points. (3)

1. (-5,-2) and (2,3) _____

2. (4,2) and (4,-7) _____

3. (5,6) and (8,2) _____

Find the midpoint of the segments having the following endpoints. (3)

4. (5,6) and (7,-3) _____

5. (-5,3) and (6,7) _____

6. (-4,6) and (8,-3) _____

Find the center and the radius of the circle. (4) Gerrit #7

7. $(x-5)^2+(y-3)^2=25$ center: _____ radius: _____

8. $(x+7)^2+(y-2)^2=81$ _____ _____

9. $x^2+y^2=8$ _____ _____

10. $x^2+y^2+8x-4y+7=0$ _____ _____

Write an equation for a circle with. (2)

11. center (0,0) and radius 6 _____

12. center (-2,-4) and radius $\sqrt{3}$ _____

Find the center, vertices, and foci. (9) Also graph numbers 13 and 15.

13. $\frac{x^2}{9}+\frac{y^2}{36}=1$

center: _____

vertices: _____ _____ _____ _____

foci: _____ _____

14. $4x^2+16y^2=16$

center: _____

vertices: _____ _____ _____ _____

foci: _____ _____

15. $\frac{(x+5)^2}{9}+\frac{(y-3)^2}{16}=1$

center: _____

vertices: _____ _____ _____ _____

foci: _____ _____

Put the equation for each ellipse in standard form. (2)

16. $5x^2+6y^2=1$ _____

17. $8x^2+2y^2+48x-4y+42=0$ _____

Name _____ Quiz, Algebra 2, 10.1-3

Find the distance between the points. (3)

1. (-3,-2) and (0,-6) _____

2. (2,-7) and (4,-3) _____

3. (5,6) and (8,-2) _____

Find the midpoint of the segments having the following endpoints. (3)

4. (4,5) and (8,-7) _____

5. (-4,0) and (5,0) _____

6. (-4,7) and (7,-4) _____

Find the center and the radius of the circle. Graph number 7. (4)

7. $(x+6)^2+(y-7)^2=4$ center: _____ radius: _____

8. $x^2+y^2=20$ _____ _____

9. $x^2+y^2+6x+4y+8=0$ _____ _____

Write an equation for a circle with. (2)

10. center (0,0) and radius 5 _____

11. center (-3,2) and radius $\sqrt{7}$ _____

Find the center, vertices, and foci. Graph number 12 and number 14. (11)

12. $\frac{x^2}{36}+\frac{y^2}{25}=1$

center: _____

vertices: _____ _____ _____ _____

foci: _____ _____

13. $4x^2+9y^2=36$

center: _____

vertices: _____ _____ _____ _____

foci: _____ _____

14. $\frac{(x-1)^2}{9}+\frac{(y-2)^2}{4}=1$

center: _____

vertices: _____ _____ _____ _____

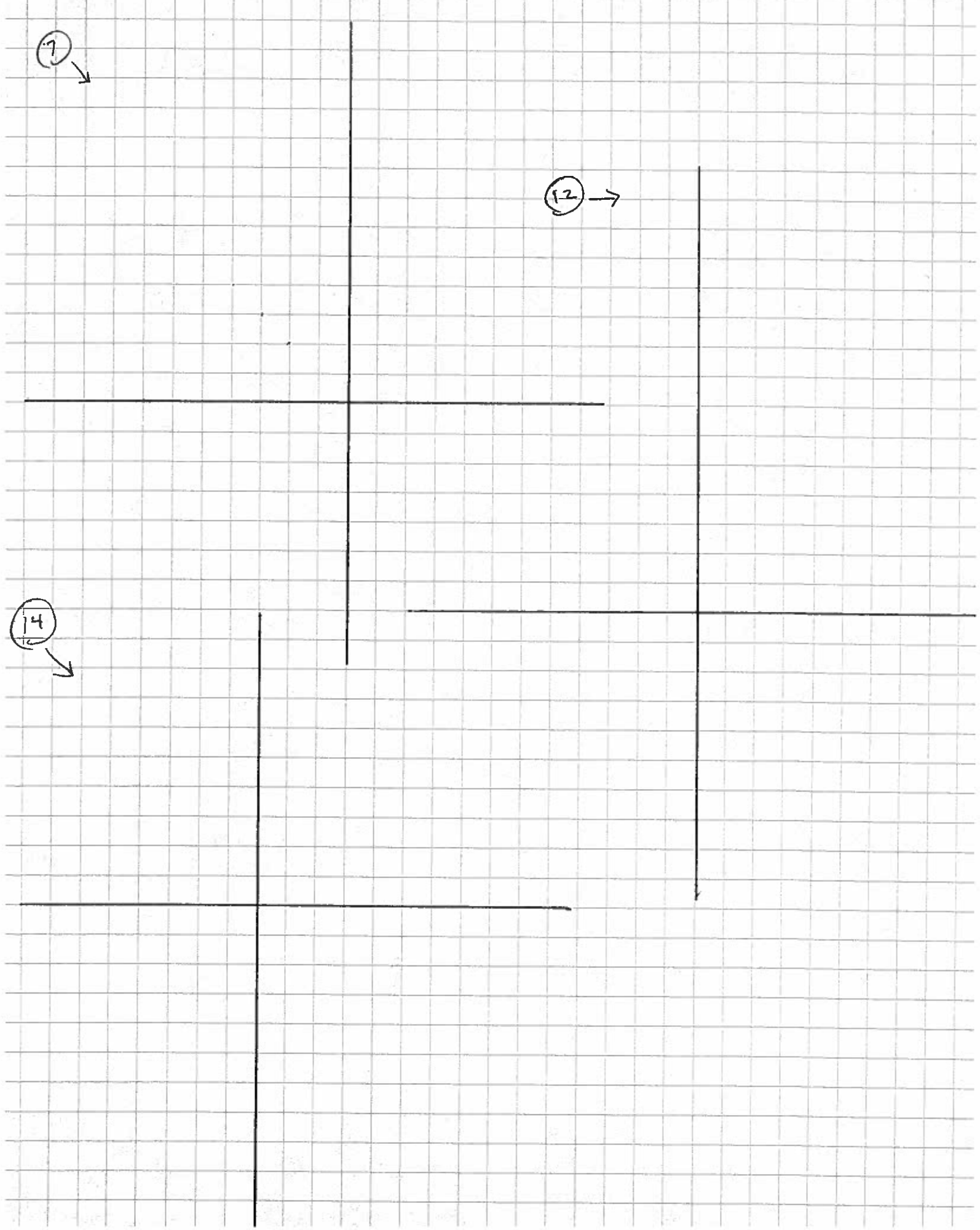
foci: _____ _____

Put the equation for each ellipse in standard form. (2)

15. $16x^2+25y^2=1$ _____

16. $16x^2+4y^2+96x-8y+84=0$ _____

NAME _____ A26 2, 10.1-3 QUIZ

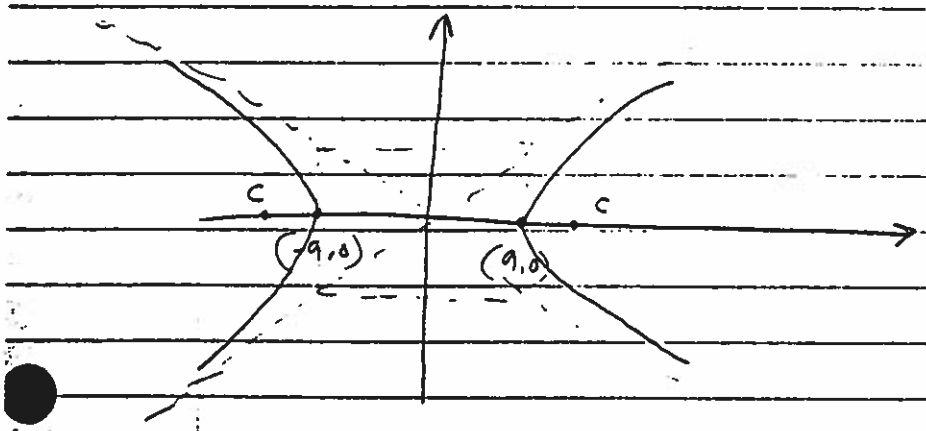


Alg 2 10.4 134

HYPERBOLAS (10.4) (Def P.736)

(CENTERED) AT ORIGIN, FOCI ON X-AXIS

$$\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$$



BRANCHES

$(\pm a, c)$ VERTICES

$\longleftrightarrow$ TRANSVERSE AXIS

$\updownarrow$ CONJUGATE AXIS

$y = \left(\frac{b}{a}\right)x \quad y = \left(\frac{-b}{a}\right)x$

ASYMPTOTES

$c = \sqrt{a^2 + b^2}$

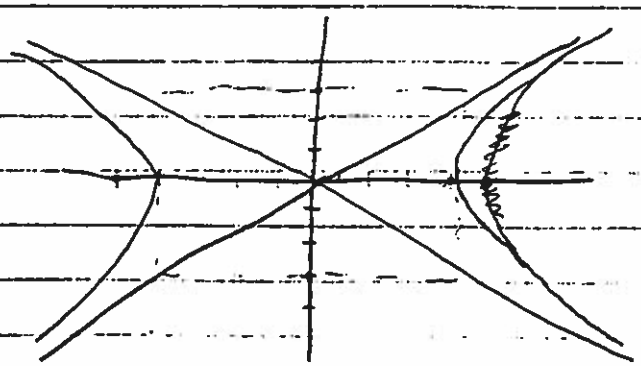
$9x^2 - 16y^2 = 144$

$$\frac{x^2}{16} - \frac{y^2}{9} = 1$$

V: $(4,0)$ $(-4,0)$

F: $(5,0)$ $(-5,0)$

A: $y = 3/4\,x$, $y = -3/4\,x$



CENTERED AT ORIGIN, FOCI ON y-AXIS

$$\frac{y^2}{b^2} - \frac{x^2}{a^2} = 1$$

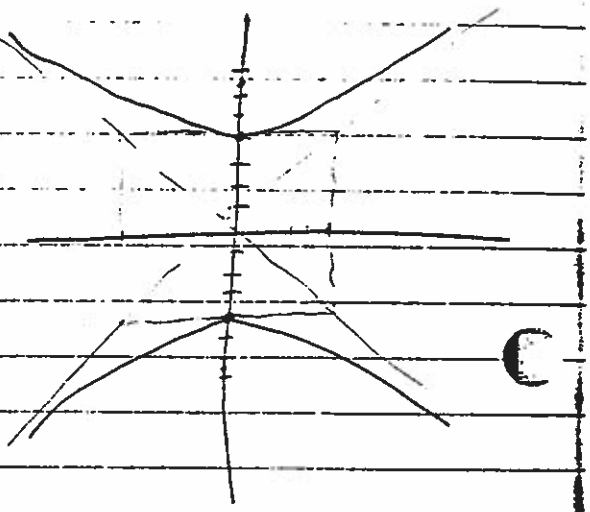
$$25y^2 - 16x^2 = 400$$

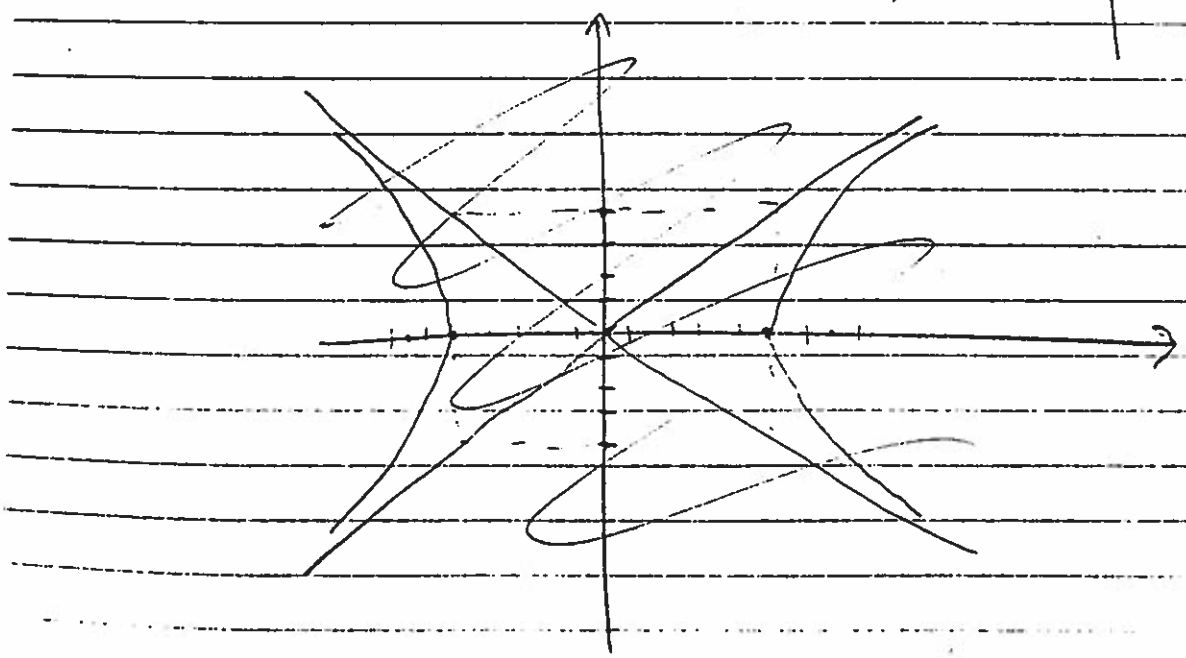
$$\frac{y^2}{16} - \frac{x^2}{25} = 1$$

V: $(0,4)$ $(0,-4)$

F: $(0,\sqrt{41})$ $(0,-\sqrt{41})$

A: $y = 4/5\,x$, $y = -4/5\,x$





$4x^2 - y^2 + 24x + 4y + 28 = 0$

$4x^2 + 24x - y^2 + 4y = -28$

$4(x^2 + 6x + 9 - 9) - (y^2 - 4y + 4 - 4) = -28$

$4(x+3)^2 - 36 - (y-2)^2 + 4 = -28$

$4(x+3)^2 - (y-2)^2 = 4$

$\frac{(x+3)^2}{1} - \frac{(y-2)^2}{4} = 1$

C: $(-3, 2)$

V: $(1,0) \longrightarrow (-2,2)$

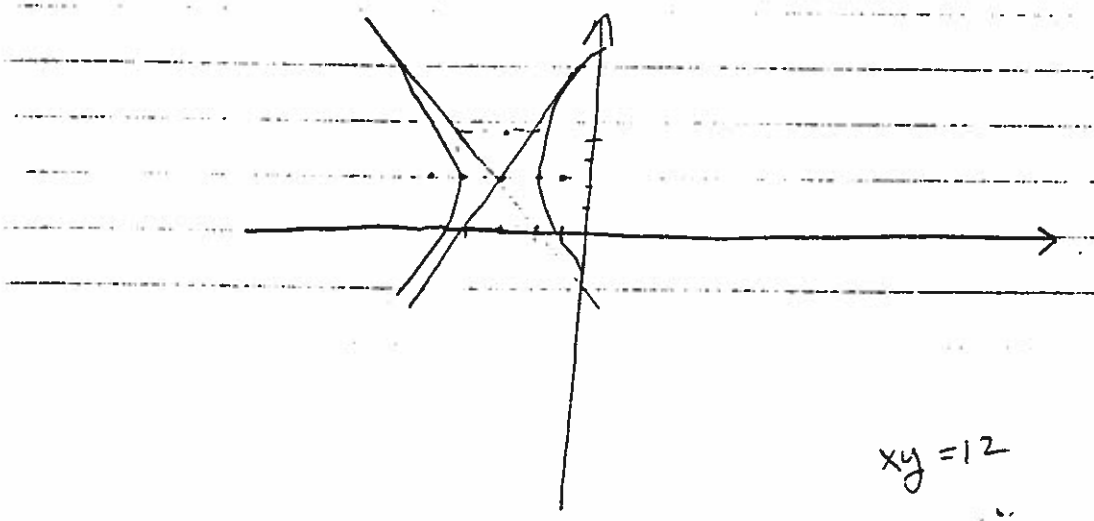
$(-1,0) \longrightarrow (-4,2)$

F: $(\sqrt{5},0) \longrightarrow (-3+\sqrt{5},2)$

$(-\sqrt{5},0) \longrightarrow (-3-\sqrt{5},2)$

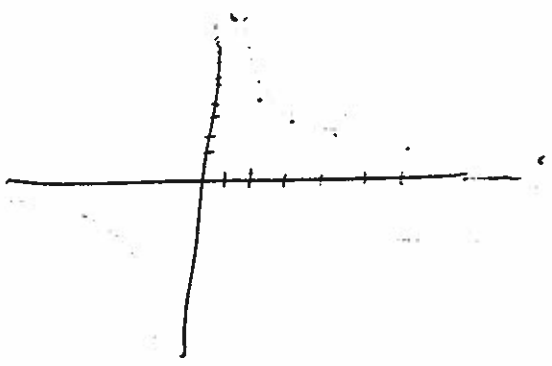
A: $y = 2x \longrightarrow y - 2 = 2(x+3)$

$y = -2x \longrightarrow y - 2 = -2(x+3)$



441: $1 - \frac{16}{20}$ odd

$xy = 12$



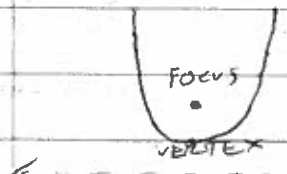
Algebra 2
10.5

441: 1-20 even is due

(10.5) Parabolas

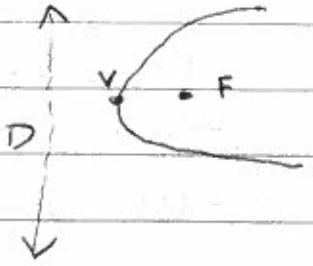
U SHAPES

DEFINITION: THE SET OF ALL POINTS IN A PLANE WHO HAVE THE SAME DISTANCE FROM A FIXED POINT (THE FOCUS) AS FROM A FIXED LINE (THE DIRECTRIX)



ANY POINT ON THE U SHOULD BE THE SAME DISTANCE FROM THE POINT AS IT IS FROM THE LINE

OR



FOR SHAPES LIKE U, THE EQUATION WILL BE $x^2 = \_\_ y$. ALL INFO WILL BE y COORDINATES

FOR C, IT WILL BE $y^2 = \_\_ x$. ALL INFO WILL BE x COORDINATES

IF THERE ARE NO PARENTHESES, THE VERTEX IS AT THE ORIGIN

TO FIND THE FOCUS, DIVIDE THE NUMBER IN THE EQUATION BY 4

TO FIND THE DIRECTRIX, CHANGE THE SIGN OF THE VERTEX'S NUMBER

IF $x^2 = 8y$

VERTEX = (0, 0)

FOCUS = (0, 2)

DIRECTRIX : $y = -2$

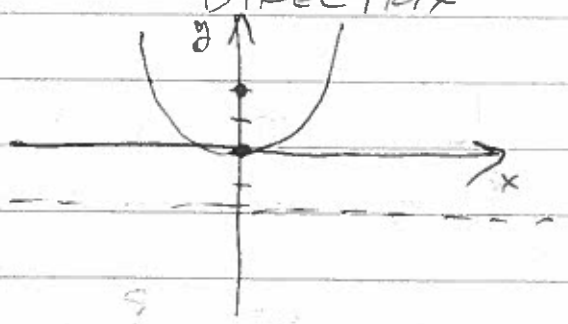
NO PARENTHESES
DIVIDE 8 BY 4
y-COORDINATE IF IT'S x^2
CHANGE SIGN OF FOCUS
IT'S $y =$ SINCE WE DID
A y-COORDINATE

GRAPH THE VERTEX 1ST

GRAPH THE FOCUS 2ND

GRAPH THE DIRECTRIX 3RD (y = LINES ARE HORIZONTAL)

DRAW A U THAT GOES AROUND THE FOCUS, WITH ITS BOTTOM AT THE VERTEX, HEADED AWAY FROM THE DIRECTRIX



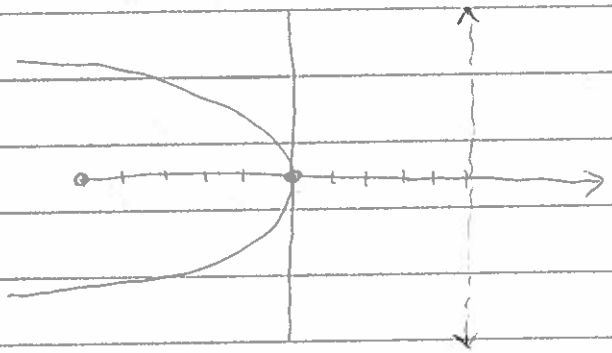
If $y^2 = -20x$

VERTEX : (0,0)

FOCUS : (-5, 0)

DIRECTRIX : $x = 5$

DIVIDE -20 BY 4
X-COORD SINCE IT'S y^2
CHANGE SIGN OF -5
DO $x =$ SINCE IT WAS X-COORD

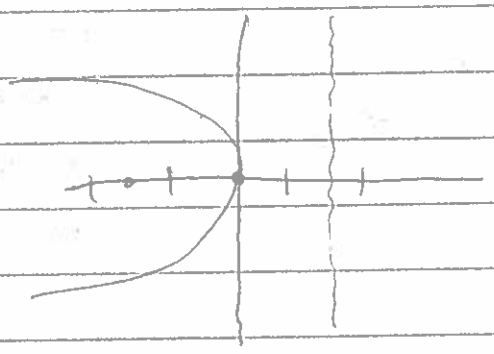


If $y^2 = -6x$

VERTEX = (0,0)

FOCUS = (-1.5, 0)

DIRECTRIX $x = 1.5$



TO WRITE AN EQUATION, REVERSE THE PROCESS - MULTIPLY THE FOCUS # BY 4. IF YOU HAD X INFO, THE EQUATION IS $y^2 =$

IF VERTEX = (0,0) FOCUS = (5,0)

$y^2 = 20x$

IF VERTEX = (0,0) FOCUS = $(0, \frac{1}{2})$

$x^2 = 2y$

IF THE EQUATION IS MESSED UP, PUT THE SQUARED VARIABLE AND ITS PARTNER ON THE LEFT AND ALL ELSE ON THE RIGHT. FACTOR BY COMPLETING THE SQUARE

$y^2 + 4x + 2y - 7 = 0$

$y^2 + 2y = -4x + 7$ — GET y'S ALONE

$y^2 + 2y + 1 = -4x + 7 + 1$ — COMPLETE SQUARE

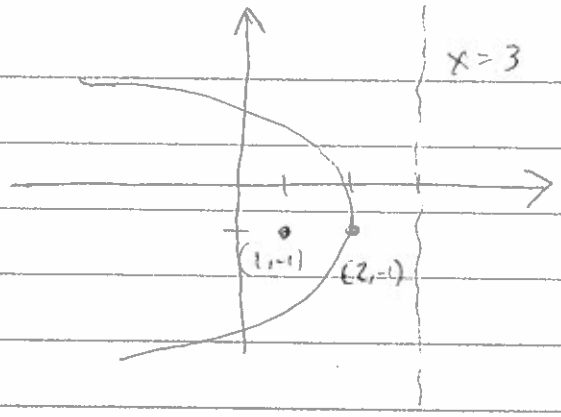
$(y+1)^2 = -4x + 8$ — FACTOR

$(y+1)^2 = -4(x-2)$ — FACTOR TO GET X ALONE

V: (2, -1)

F: WOULD HAVE BEEN (-1, 0) ... MOVED TO (1, -1)

D: WOULD HAVE BEEN $x = 1$ ... MOVED TO $x = 3$



$x^2 + 2x - 8y - 3 = 0$

$x^2 + 2x = 8y + 3$

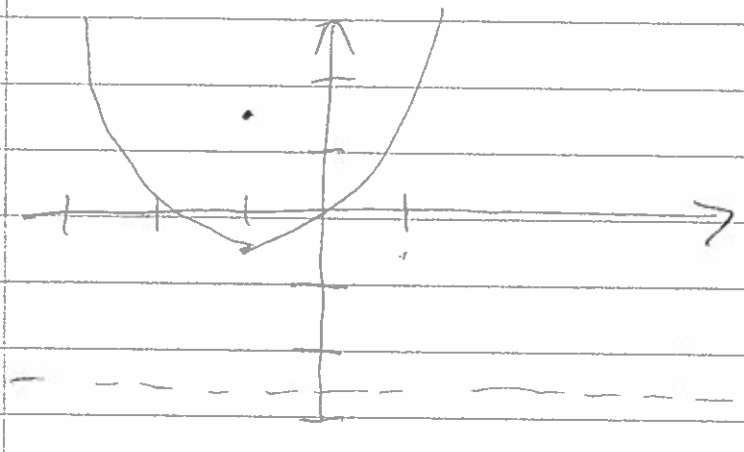
$x^2 + 2x + 1 = 8y + 3 + 1$

$(x+1)^2 = 8(y + \frac{1}{2})$

V: $(-1, -\frac{1}{2})$

F: ~~$(0,2)$~~ $(-1, 1\frac{1}{2})$

D: ~~$y = -2$~~ $y = -2\frac{1}{2}$



DO 447: 1-24 GRAPH ODDS ONLY

DO INFO FOR ALL

Name _____

PRACTICE

Quiz, Algebra 2, 10.4-5

Find the center, vertices, foci, and asymptotes. (12)

1. $\frac{x^2}{4} - \frac{y^2}{1} = 1$

center: _____

vertices: _____ _____

foci: _____ _____

asymptotes: _____ _____

2. $16y^2 - 9x^2 = 144$

center: _____

vertices: _____ _____

foci: _____ _____

asymptotes: _____ _____

3. $\frac{(x-1)^2}{4} - \frac{(y-2)^2}{1} = 1$

center: _____

vertices: _____ _____

foci: _____ _____

asymptotes: _____ _____

Put the equation for each hyperbola in standard form. (1)

4. $9x^2 - 4y^2 + 54x + 8y + 41 = 0$ _____

Find the vertex, focus, and directrix of the parabola. (9)

5. $x^2 = 8y$

vertex: _____

focus: _____

directrix: _____

6. $y^2 = -2x$

vertex: _____

focus: _____

directrix: _____

7. $(y-3)^2 = -20(x+2)$

vertex: _____

focus: _____

directrix: _____

Put the equation of a parabola in standard form. (2)

8. $x^2 + 2x + 2y + 7 = 0$ _____

9. $4y^2 - 4y - 4x + 24 = 0$ _____

Write an equation of a parabola satisfying the given conditions. (2)

10. Focus (4,0) directrix x = -4 _____

11. Focus (0,-3), directrix y = 3 _____

Graph the hyperbola (2)

12. number 1

13. number 3

Graph a parabola with (2)

14. vertex (0,0) focus (-3,0) directrix x = 3

15. vertex (-5,-3) focus (-3,-3) directrix x = 7

extra credit: Write an equation for number 15.