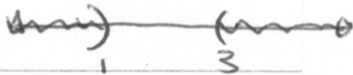
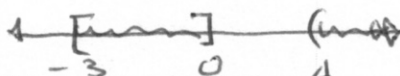


Solutions

1	$(3, 4)$	11	$x \approx 7.7$ $x \approx 0.3$	$x = 4 \pm \sqrt{14}$
2	$x = 3$	12	See Graph Paper	
3	opens Down	13		
4	$(0, -14)$	14		
5	$x \approx 4.4$ $x \approx 1.6$	15		
6	See Graph Paper	16	See Graph Paper	
7	$(4, -14)$	17	See Graph Paper	
8	$x = 4$	18	See Graph Paper	
9	opens up	19	See Graph Paper	
10	$(0, 2)$	20	See Graph Paper	

$$x = 3 \pm \sqrt{2}$$

33 ✓

East Los Angeles College
Department of Mathematics
Math 125
Test 4

Given the following quadratic equation, determine the following.

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

- | | |
|-----------------------|---------------------|
| 1. Vertex | 2. Axis of Symmetry |
| 3. Opens up or down | 4. y-intercept(s) |
| 5. x-intercept | |
| 6. Graph the parabola | |

Given the following quadratic equation, determine the following.

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

- | | |
|------------------------|---------------------|
| 7. Vertex | 8. Axis of Symmetry |
| 9. Opens up or down | 10. y-intercept(s) |
| 11. x-intercept | |
| 12. Graph the parabola | |

Graph the following solutions set using sign analysis.

13. $x^2 - 4x > -3$

14. $\frac{x-1}{x-2} > 1$

15. $\frac{x(x+3)}{x-4} \geq 0$

Graph the following Conic Sections.

16. $x^2 + y^2 = 25$

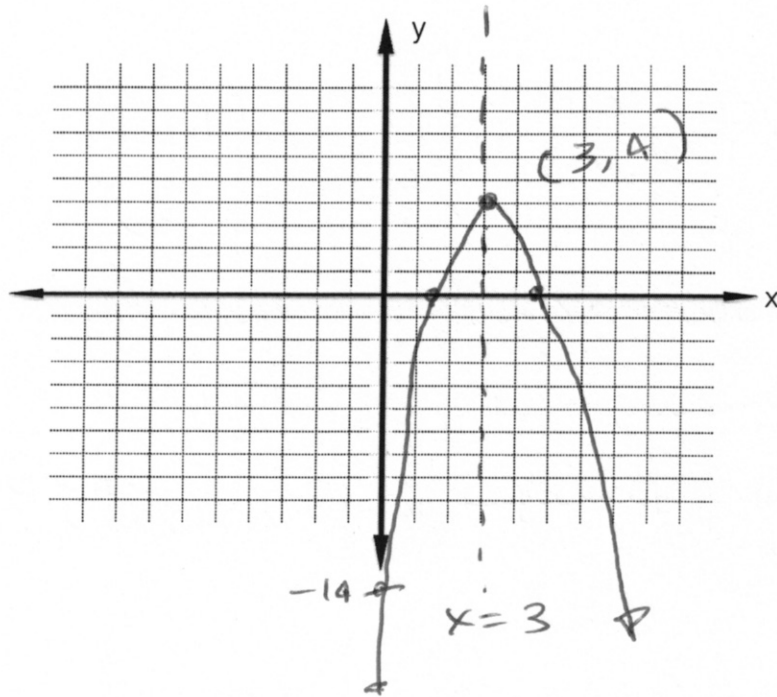
17. $4(x - 3)^2 + 25(y + 2)^2 = 100$

18. $(x + 1)^2 - 4(y - 1)^2 = 16$

19. $x^2 + y^2 - 8y + 15 = 0$

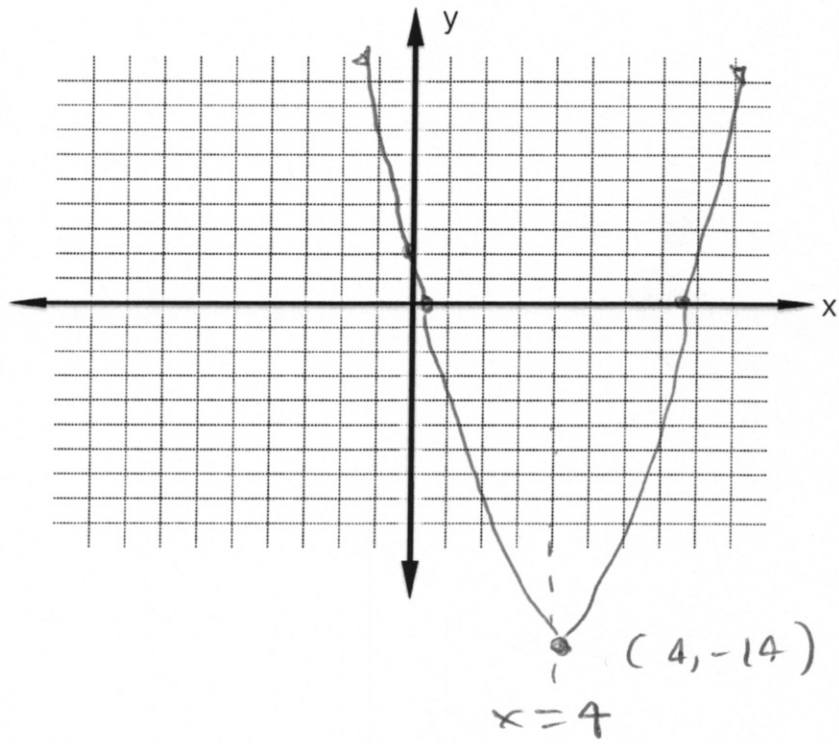
20. $x^2 + y^2 + 6x + 4y = 12 = 0$

(6)

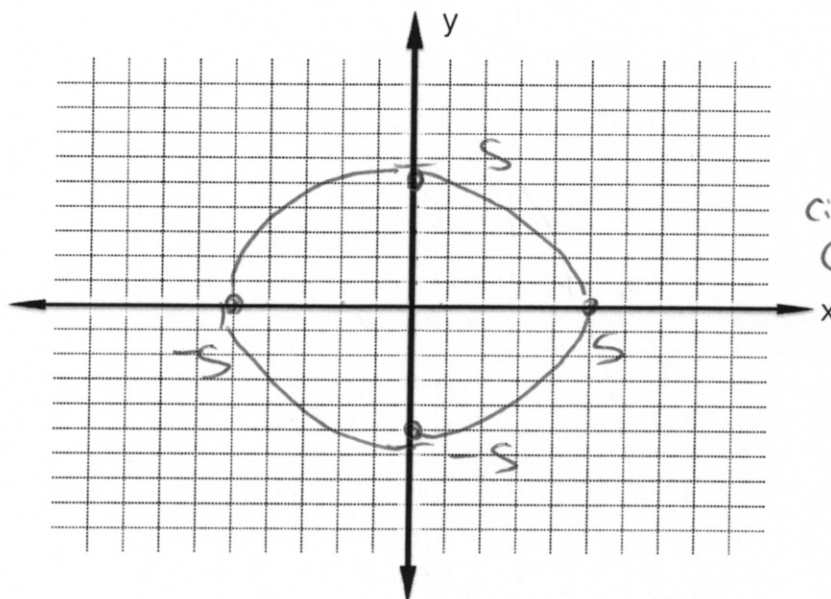


(4)

(12)



(16)

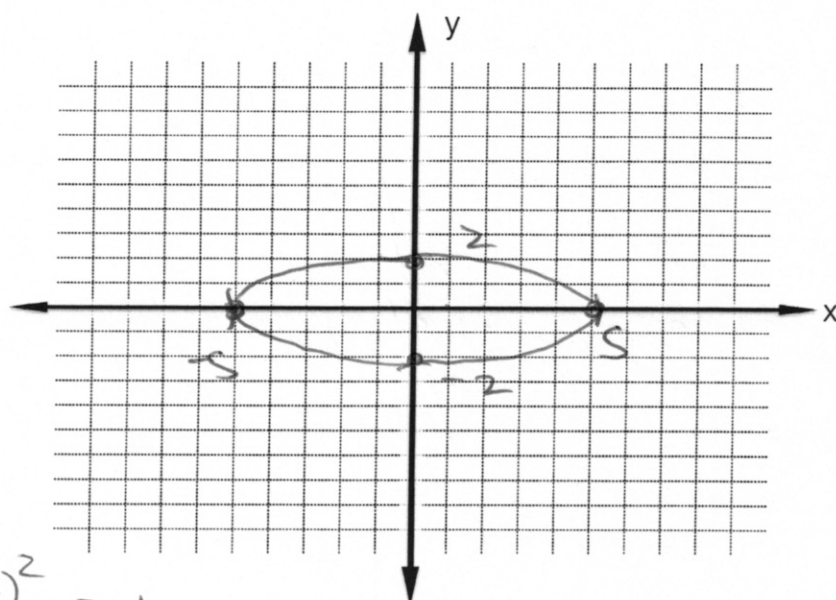


circle
(0,0)

$$r = 5$$

$$x^2 + y^2 = 5$$

(17)



ellipse

$$\frac{(x-3)^2}{25} + \frac{(y+2)^2}{4} = 1$$

math 125 Test 4

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

$\begin{matrix} p & p \\ h & k \end{matrix}$

- ① Vertex (h, k) ; $(3, 4)$
- ② axis of Symmetry ; $x = 3$
- ③ opens down ; $a = -2 < 0$
- ④ y-int let $x = 0$; Solve for y

$$y = -2(0-3)^2 + 4$$

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

$$= -2 \cdot 9 + 4 ; y = -18 + 4 ;$$

- ⑤ x-int let $y = 0$; Solve for x $y = -14$

$$0 = -2(x-3)^2 + 4 ; \quad \frac{-4}{-2} = \frac{-2(x-3)^2}{-2}$$

$$(x-3)^2 = 2$$

$$x-3 = \pm\sqrt{2} ; x = 3 \pm \sqrt{2}$$

$$x = 3 + \sqrt{2}$$

$$; x = 3 - \sqrt{2}$$

$$x \approx 4.414$$

$$x = 1.586$$

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

$$\frac{b}{2} = \frac{-8}{2} = -4$$

complete the Square

$$\left(\frac{b}{2}\right)^2 = (-4)^2 = 16$$

$$y = x^2 - 8x + (16 - 16 + 2)$$

$$y = (x - 4)^2 - 14$$

(7) vertex (h, k) $(4, -14)$

(8) axis of Symmetry $x = 4$

(9) opens up $a = 1$

(10) y-int $x = 0$ Solve for y

$$y = 0^2 - 8 \cdot 0 + 2 \quad y = 2$$

(11) x-int $y = 0$ Solve for x

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

$$\text{or } (x - 4)^2 - 14 = 0 \quad ; \quad (x - 4)^2 = 14$$

$$x - 4 = \pm \sqrt{14} \quad ; \quad x = 4 \pm \sqrt{14}$$

$$x = 4 + \sqrt{14}$$

$$x = 4 - \sqrt{14}$$

$$x \approx 7.7$$

$$x \approx 0.3$$

$$(13) \quad x^2 - 4x > -3 \quad ; \quad x^2 - 4x + 3 > 0$$

$+3 \quad +3$

$$(x-3)(x-1) > 0$$

$$(x-3)(x-1) = 0$$

$$x-3=0$$

$$x-1=0$$

$$(x=3)$$

$$(x=1)$$

(I)

(II)

(III)

+

0

-

+

1

2

3

4

(T)

(T)

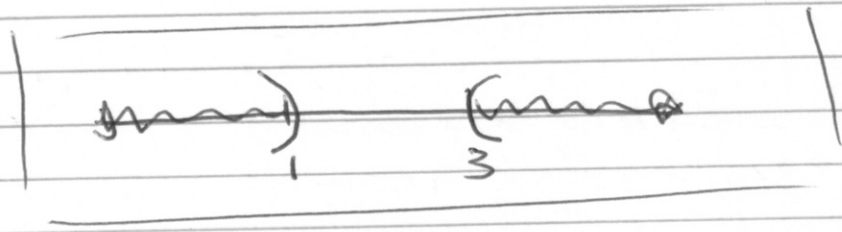
(T)

$$(x-3)(x-1)$$

0

0

-3 (-)



$$(14) \quad \frac{x-1}{x-2} > 1 \quad ; \quad \frac{x-1}{x-2} - 1 > 0$$

$$\frac{x-1}{x-2} - \frac{(x-2)}{x-2} > 0 \quad ; \quad \frac{x-1-x+2}{x-2} > 0$$

$$\frac{1}{x-2} > 0$$

(I)

(II)

-

0

+

1

2

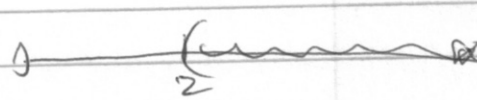
0

2

note $x-2=0$

$$(x=2)$$

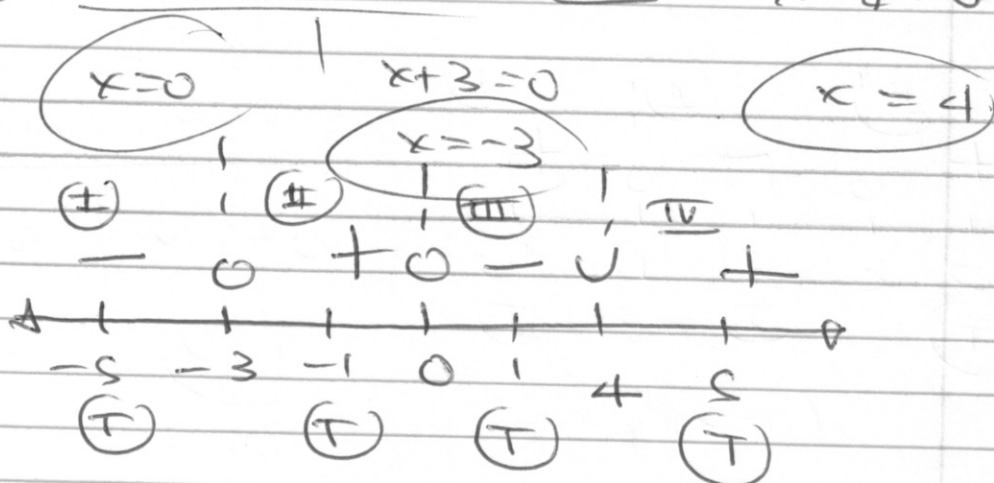
$$\frac{1}{x-2}$$



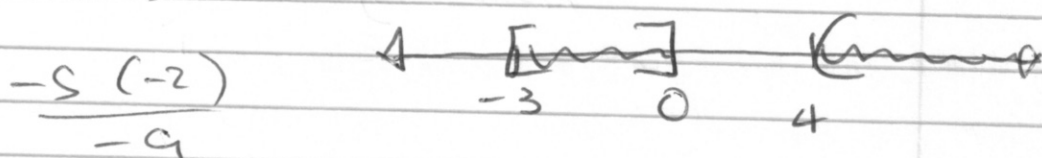
$$(15) \quad \frac{x(x+3)}{x-4} \geq 0$$

note $x(x+3) = 0$

note $x-4 = 0$



$$\frac{x(x+3)}{x-4} \geq 0$$



$$(16) \quad x^2 + y^2 = 25$$

circle $(0,0)$; $r=5$

$$(17) \quad \frac{4(x-3)^2}{100} + \frac{25(y+2)^2}{100} = \frac{100}{100}$$

$$\frac{(x-3)^2}{25} + \frac{(y+2)^2}{4} = 1$$

ellipse

center $(3, -2)$ $a^2 = 25$ $b^2 = 4$

$a = \pm 5$ $b = \pm 2$

$$(19) \quad \frac{(x+1)^2}{16} - \frac{4(y-1)^2}{16} = \frac{16}{16}$$

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

center $(-1, 1)$; $a^2 = 16$; $b^2 = 4$
 $a = \pm 4$; $b = \pm 2$

Hyperbola

$$(19) \quad x^2 + y^2 - 8y + 15 = 0$$

$$\frac{b}{2} = \frac{-y}{2} = -4 \quad ; \quad \left(\frac{b}{2}\right)^2 = (-4)^2 = 16$$

$$x^2 + y^2 - 8y + 16 - 16 + 15 = 0$$

$$x^2 + (y-4)^2 - 1 = 0$$

$$x^2 + (y-4)^2 = 1 \quad \text{circle}$$

center $(0, 4)$ $r = 1$

$$(20) \quad x^2 + y^2 + 6x + 4y + 12 = 0$$

complete the Square

$$x^2 + 6x + y^2 + 4y + 12 = 0$$

$$(x) \quad \frac{b}{2} = \frac{6}{2} = 3 \quad \left(\frac{b}{2}\right)^2 = 3^2 = 9$$

$$\frac{b}{2} = \frac{4}{2} = 2 \quad \left(\frac{b}{2}\right)^2 = 2^2 = 4$$

$$\underline{x^2 + 6x + 9} + \underline{y^2 + 4y + 4} + 12 = 9 + 4$$

$$(x+3)^2 + (y+2)^2 + 12 = 13$$

-12 -12

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

Circle $(-3, -2)$; $r = 1$