Algebra 2 Name_____

Review Topics for Exam #13

Date_____ Period____

Solve each system of equations.

1) $x^2 + y^2 - 43x + 3y + 42 = 0$
$3x + y + 2 = 0$

2) $-4y^2 - 90x - 2y + 20 = 0$
$3x + y = 2$

3) $x^2 + y^2 + 4x + 36y - 42 = 0$
$x + 3y = 4$

4) $-6x^2 + 2y^2 + 3x + 3y - 6 = 0$
$x + y + 2 = 0$

5) $7x^2 + 56x + y + 106 = 0$
$7x^2 + 9y^2 + 56x - 44y + 52 = 0$

6) $x^2 - y^2 - 12x - 14y - 29 = 0$
$6x^2 + y^2 - 72x + 14y + 169 = 0$

7) $2x^2 - y^2 + 11x - 8y - 92 = 0$
$2x^2 - y^2 + 14x - 8y - 104 = 0$

8) $2x^2 + x + y - 5 = 0$
$19x^2 + x + y - 5 = 0$

Identify the vertex, focus, directrix, direction of opening, min/max value, and the x & y intercepts. Then sketch the graph.

9) $-y^2 + x + 8y - 16 = 0$

10) $-3x^2 - 27x + y - 54 = 0$

11) $2y^2 + x + 6y = 0$

12) $-2x^2 - 22x + y - 60 = 0$

Use the information provided to write the standard form equation of each ellipse.

13) Vertices: $(-7, 20)$, $(-7, -2)$
Co-vertices: $(2, 9)$, $(-16, 9)$

14) Vertices: $(5, 16)$, $(5, -8)$
Co-vertices: $(9, 4)$, $(1, 4)$

15) Vertices: $(9, -5)$, $(-1, -5)$
Foci: $(7, -5)$, $(1, -5)$

16) Foci: $(-6, 5)$, $(-6, -7)$
Endpoints of major axis: $(-6, 9)$, $(-6, -11)$

17) Foci: $(5, -5)$, $(-19, -5)$
Endpoints of major axis: $(6, -5)$, $(-20, -5)$

18) Center: $(-3, -4)$
Vertex: $(-3, 8)$
Co-vertex: $(-1, -4)$

Identify the points of discontinuity, holes, vertical asymptotes, x-intercepts, horizontal asymptote, and domain of each.

19) $f(x) = \dfrac{x^3 - 3x^2 - 4x}{4x^2 - 28x + 48}$

20) $f(x) = \dfrac{x^3 + 5x^2 + 6x}{x^3 + 7x^2 + 12x}$

21) $f(x) = \dfrac{-3x^3 + 3x^2 + 18x}{x^3 - 9x}$

22) $f(x) = \dfrac{x - 1}{4x}$

23) $f(x) = \dfrac{x^2 + 3x}{-x^2 + x + 12}$

24) $f(x) = \dfrac{x^3 - 2x^2 - 8x}{-3x^2 + 27}$

25) $f(x) = \dfrac{x}{4x^3 + 4x^2 - 24x}$

26) $f(x) = \dfrac{x^3 - 4x}{-3x^2 - 6x + 9}$

Answers to Review Topics for Exam #13

1) $(2, -8)$

2) $(-1, 5), (0, 2)$

3) $(7, -1), (1, 1)$

4) $(1, -3)$

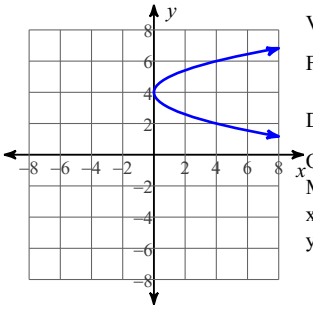
5) $(-4, 6), (-3, -1), (-5, -1)$

6) $(2, -7), (10, -7)$

7) $(4, -4)$

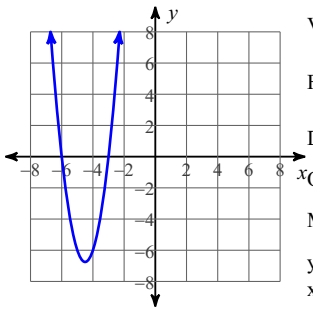
8) $(0, 5)$

9)



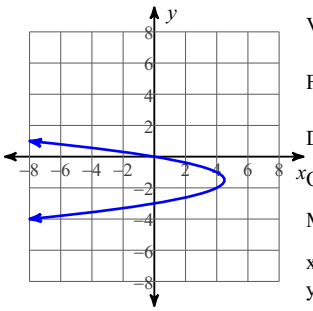
Vertex: $(0, 4)$
Focus: $\left(\frac{1}{4}, 4\right)$
Directrix: $x = -\frac{1}{4}$
Opens: Right
Min value = 0
x-int: 16
y-int: 4

10)



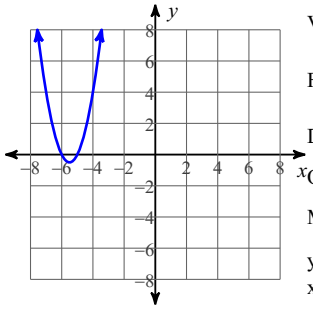
Vertex: $\left(-\frac{9}{2}, -\frac{27}{4}\right)$
Focus: $\left(-\frac{9}{2}, -\frac{20}{3}\right)$
Directrix: $y = -\frac{41}{6}$
Opens: Up
Min value = $-\frac{27}{4}$
y-int: 54
x-int: –6 and –3

11)



Vertex: $\left(\frac{9}{2}, -\frac{3}{2}\right)$
Focus: $\left(\frac{35}{8}, -\frac{3}{2}\right)$
Directrix: $x = \frac{37}{8}$
Opens: Left
Max value = $\frac{9}{2}$
x-int: 0
y-int: 0 and –3

12)



Vertex: $\left(-\frac{11}{2}, -\frac{1}{2}\right)$
Focus: $\left(-\frac{11}{2}, -\frac{3}{8}\right)$
Directrix: $y = -\frac{5}{8}$
Opens: Up
Min value = $-\frac{1}{2}$
y-int: 60
x-int: –6 and –5

13) $\frac{(x+7)^2}{81} + \frac{(y-9)^2}{121} = 1$

14) $\frac{(x-5)^2}{16} + \frac{(y-4)^2}{144} = 1$

15) $\frac{(x-4)^2}{25} + \frac{(y+5)^2}{16} = 1$

16) $\frac{(x+6)^2}{64} + \frac{(y+1)^2}{100} = 1$

17) $\frac{(x+7)^2}{169} + \frac{(y+5)^2}{25} = 1$

18) $\frac{(x+3)^2}{4} + \frac{(y+4)^2}{144} = 1$

19) Discontinuities: 3, 4
Vertical Asym.: $x = 3$
Holes: $x = 4$
Horz. Asym.: None
X-intercepts: 0, –1
Domain: All reals except 3, 4

20) Discontinuities: –4, 0, –3
Vertical Asym.: $x = -4$
Holes: $x = 0$, $x = -3$
Horz. Asym.: $y = 1$
X-intercepts: –2
Domain: All reals except –4, 0, –3

21) Discontinuities: –3, 0, 3
Vertical Asym.: $x = -3$
Holes: $x = 0$, $x = 3$
Horz. Asym.: $y = -3$
X-intercepts: –2
Domain: All reals except –3, 0, 3

22) Discontinuities: 0
Vertical Asym.: $x = 0$
Holes: None
Horz. Asym.: $y = \frac{1}{4}$
X-intercepts: 1
Domain: All reals except 0

23) Discontinuities: 4, –3
Vertical Asym.: $x = 4$
Holes: $x = -3$
Horz. Asym.: $y = -1$
X-intercepts: 0
Domain: All reals except 4, –3

24) Discontinuities: 3, −3
Vertical Asym.: $x = 3$, $x = -3$
Holes: None
Horz. Asym.: None
X-intercepts: 0, 4, −2
Domain: All reals except 3, −3

25) Discontinuities: 2, −3, 0
Vertical Asym.: $x = 2$, $x = -3$
Holes: $x = 0$
Horz. Asym.: $y = 0$
X-intercepts: None
Domain: All reals except 2, −3, 0

26) Discontinuities: 1, −3
Vertical Asym.: $x = 1$, $x = -3$
Holes: None
Horz. Asym.: None
X-intercepts: 0, 2, −2
Domain: All reals except 1, −3