KCAT	M – Graphing 10 & 11-	2012	Name	Schoo	ol				
1)	1) What conic section is described by the equation $x^2 - 3y^2 = 11$?								
	A) Circle	B) Ellipse	C) Hyperbola	D) Parabola	E) not given				
2)) What conic section is formed when a plane intersects both halves of a cone?								
	A) Circle	B) Ellipse	C) Hyperbola	D) Parabola	E) not given				
3)	What is the slope of the line passing through the points $(3, 8)$ and $(4, 2)$?								
	A) 6	B) -6	C) 1/6	D) -1/6	E) not given				
4)	What is the slope of the line perpendicular to $3x + 5y = 17$?								
	A) 3/5	B) -3/5	C) 5/3	D) -5/3	E) not given				
5)	Identify the y-coordinate of the vertex of $y = 3x - 7 $.								
	A) 7/3	B) -7/3	C) 0	D) 1	E) not given				
6)	Identify the x-coordinate of the vertex of $y = 4x^2 + 17x - 9$.								
	A) 17/4	B) -17/4	C) 17/8	D) -17/8	E) not given				
7)	Identify the y-coordinate of the y-intercept of $y = -5 - 2x $.								
	A) 5	B) 0	C) -5	D) -2	E) not given				
8)	Which of the following points is <u>not</u> on the graph of $y = 4 \sec(\pi x)$?								
	A) (0, 4)	B) (1, -4)	C) (2, 4)	D) (3, -4)	E) all on graph				
9)	The function $f(x) = \log_7(3x - 11)$ passes through the point (k, 1). Find k.								
	A) 4	B) 5	C) 6	D) 7	E) not given				
10)	The point (-3, 8) is loca	ated in which quadrant?							
	A) 1 st	B) 2 nd	C) 3 rd	D) 4 th	E) not given				
11)	11) Let $f(x) = \sqrt{x}$. Which point is <u>not</u> on $f^{-1}(x)$?								
	A) (-1, 1)	B) (0,0)	C) (1, 1)	D) (2, 4)	E) all on f^{-1}				

- 12) Let line B have the equation 3x + 5y = 12 and line C have the equation x = -1, find the y-coordinate where lines B and C intersect.
 - A) 1 B) 2 C) 3 D) 4 E) not given
- 13) What word or phrase best describes the triangle with vertices at (0, 0), (5, 0), and (0, 5)?
 - A) Right & Isosceles B) Acute & Scalene C) Right & Scalene D) Acute & Isosceles E) equilateral
- 14) Find the equation of the axis of symmetry of $y = x^2 2x + 1$.
 - A) x = 0 B) x = 1 C) x = 2 D) x = -1 E) not given
- 15) How many times does $x^2 + y^2 = 1$ intersect $y = x^2 25$?
 - A) 0
 B) 1
 C) 2
 D) 3
 E) 4

16) Which number is not in the range of $y = -\sqrt{3-x}$?

- A) -3
 B) -2
 C) 0
 D) 1
 E) all in range
- 17) The function $f(x) = x^3$ is vertically stretched by a factor of 4 and translated down 10 units. After applying both transformations, the point that was originally at (2, 8) is now where?
 - A) (2, 12) B) (2, 22) C) (8, 12) D) (8, 22) E) not given

18) Which of the following is a vertical asymptote for $f(x) = \sec\left(\frac{1}{3}x\right)$? A) $x = \pi$ B) $x = 2\pi$ C) $x = 3\pi$ D) $x = 4\pi$ E) $x = 5\pi$

19) What is the minimum value of
$$y = 3(x+2)^2 - 17$$
?

 A) 3
 B) -2
 C) 2
 D) -17
 E) not given

20) An ellipse has vertices at (2, 9), (12, 9), (7, 14) and (7, 0). Find the length of the major axis.

A) 2 B) 7 C) 10 D) 14 E) not given

21) How many times do the graphs of y = x and y = sin(x) intersect?

A) 0 B) 1 C) 2 D) 3 E) not given

22) How many <u>unique</u> zeros does the function $f(x) = x^4 + 2x^3 - 399x^2$ have in the interval [-10, 10]?

A) 0 B) 1 C) 2 D) 3 E) 4

For questions 23 – 27, let $y = 3(x-2)^3 - 11$. 23) What word best describes the graph of y? A) Linear B) Quadratic C) Cubic D) Exponential E) Sinusoidal 24) Which of the following points is on the graph? A) (1, -14) B) (1, -8) C) (1, -2) D) (1, 4) E) (1, 10) 25) Find the y-intercept of the graph. A) (0, -11) B) (0, -2) C) (0, 13) D) (0, -35) E) not given 26) For what value of x does y = -11? A) 0 **B**) 1 D) 3 C) 2 E) 4 27) Find the y-coordinate of the point where y intersects the vertical line x = 7? A) 353 B) 364 C) 375 D) 386 E) not given 28) Which of the following functions does not intersect its inverse relation? A) $f(x) = \ln(x)$ B) $f(x) = \sqrt{x}$ C) $f(x) = \sin^{-1}(x)$ D) $f(x) = \frac{8x+7}{3}$ E) $f(x) = x^3$ 29) Let $f(x) = 3\sqrt{x-2} - 8$. Compute f(18). B) 2 C) 3 A) 1 D) 4 E) not given

30) Let f(x) = ax + b, where a and b are integers such that a < b < 0. Which of the following statements is/are true?

			The function is lim The function is de f(1) will be positi	The function is linear. The function is decreasing. f(1) will be positive.		
A) I only	B) II only		C) III only	D) I and II only	E) I, II, and III	

31) Which of the following equations is a polynomial?

A)
$$f(x) = \frac{1}{x}$$
 B) $f(x) = \sqrt{x}$ C) $f(x) = (x-1)^{\sqrt{25}}$ D) $f(x) = 3^x$ E) $f(x) = x^{-3}$

32)	32) The point (2, 6) is reflected about the x-axis. What is the resulting point?						
	A) (2, -6)	B) (6, 2)	C) (-2, 6)	D) (-2, -6)	E) (-6, -2)		
33)	The lines $2x - 3y = 7$ at	nd $4x + By = 9$ are perpendent	endicular. Find B.				
	A) 6	B) -6	C) 3/2	D) -3/2	E) not giver		
For que	estions 33 – 35, a circle i	s centered at (-3, 2) and	contains the point (3, -6)				
34)	What is the radius of th	e circle?					
	A) 6	B) 7	C) 8	D) 9	E) 10		
35)	34) what is the radius of the circle?A) 6B) 7C) 8D) 9E) 1035) Which of the following points is also on the circle?						
	A) (-11, -4)	B) (0, 5)	C) (9, -12)	D) (11, 6)	E) (1,8)		
36)	The point (6, M) is loc	ated inside the circle. W	hich of the following is a	a possible value for M?			

A) -3 B) 3 C) 7 D) 11 E) -7

37) Which of the following functions will not have a vertical asymptote?

- A) $f(x) = \frac{3x^2 13x + 4}{x^2 9}$ B) $f(x) = \frac{x^2 + 1}{2x^2 1}$ C) $f(x) = \frac{3x^2 12x}{5x 20}$
- D) $f(x) = \frac{x}{2x^2 7x}$ E) All of these will have vertical asymptotes.
- 38) Which of the following functions has a removable discontinuity (hole)?
 - A) $f(x) = \frac{3x^2 13x + 4}{x^2 9}$ B) $f(x) = \frac{x^2 + 1}{2x^2 1}$ C) $f(x) = \frac{3x^2 12x}{5x 20}$
 - D) $f(x) = \frac{x}{2x^2 7x}$ E) Both C and D

39) What is the maximum number of turning points that a 5th degree polynomial can have?

A) 1 B) 2 C) 3 D) 4 E) 5

40) For what value of x does $f(x) = \frac{x^2 - 6x + 7}{x^2 - 3x + 10}$ intersect its horizontal asymptote?

A) -4 B) -3 C) -2 D) -1 E) 0