PRECALCULUS REVIEW PROBLEMS

This multiple-choice exam is based on the content of our Precalculus (MATH 1730) class, as well as the Calculus Readiness Test (Form 1E 1990) devised by the Mathematical Association of America. It is purely a diagnostic tool to help you judge your familiarity with precalculus topics - it is NOT an official testing instrument. The answers appear at the end of the exam. If you miss more than half of the problems, there is a good chance that you need to enroll in MATH 1730 before taking calculus. (However, you should seek advice from the Math Department before making decisions.)

1	(1)	\ Т	he slor	e of the	e line	3x = 4u	<u> </u>	Ω	is
١	L,)	ne siot	еогин	e mie .	$\mathfrak{I}x - \mathfrak{I}y$	$+\circ=$	U	$_{15}$

(a)
$$m = -4$$
 (b) $m = 3$

(c)
$$m = 3/4$$
 (d) $m = 4/3$

(2) _____ The domain of the function
$$f(x) = \ln(2x - 1)$$
 is

- (a) all real numbers. (b) all real numbers except x = 0.
- (c) the set x > 0. (d) the set x > 1/2.
- (3) If a rational function f is known to have a vertical asymptote at x = a and a removable singularity at x = b, which of the following formulas could represent f?

(a)
$$f(x) = \frac{(x+a)^2(x+b)}{(x+a)^3(x+b)}$$

(b)
$$f(x) = \frac{(x+a)}{(x+a)(x+b)}$$

(c)
$$f(x) = \frac{(x-a)(x-b)}{(x-a)(x-b)^2}$$

(d)
$$f(x) = \frac{(x-a)(x-b)^2}{(x-a)^2(x-b)}$$

(4)) _____ If
$$Arctan(tan(\theta)) = \theta$$
, then we know that

(a)
$$-\pi/2 < \theta < \pi/2$$

(b)
$$0 < \theta < \pi$$

(c)
$$-\pi/2 < \theta < \pi$$

(d)
$$-\pi < \theta < \pi$$

(5) _____ If
$$f(x) = 1 + \sin(3x - \pi/2)$$
, then one solution to the equation $f(x) = 3/2$ is

(a)
$$x = 5\pi/18$$

(b)
$$x = 2\pi/9$$

(c)
$$x = (60 + \pi)/6$$

(d)
$$x = (20 + \pi)/2$$

(6) _____ The slope of the line passing through the points
$$(-2,1)$$
 and $(4,2)$ is

(a)
$$m = 1/6$$

(b)
$$m = 2$$

(c)
$$m = -6$$

(d)
$$m = -2$$

(7) ______ If the radian measure for an angle
$$\theta$$
 is $-6\pi/5$, then the degree measure for θ is

(a)
$$150^{\circ}$$

(b)
$$-216^{\circ}$$

$$(d) -150^{\circ}$$

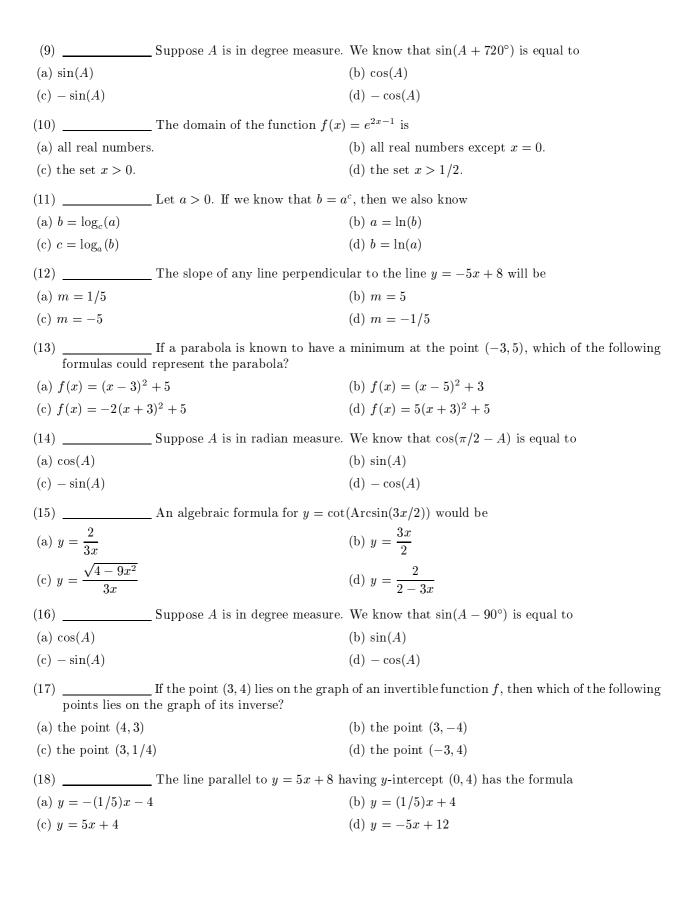
(8) _____ If a rational function
$$f$$
 is known to have a horizontal asymptote at $y = 3$, which of the following formulas could represent f ?

(a)
$$f(x) = x + 3 + \frac{1}{x^2 + 3}$$

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

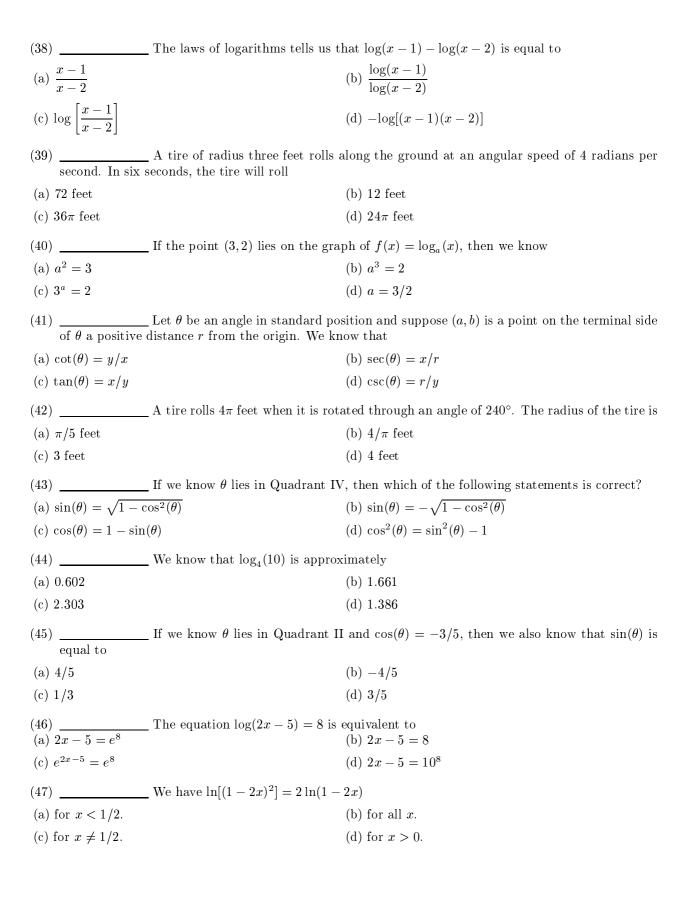
(c)
$$f(x) = \frac{3}{(x-1)(x-2)^2}$$

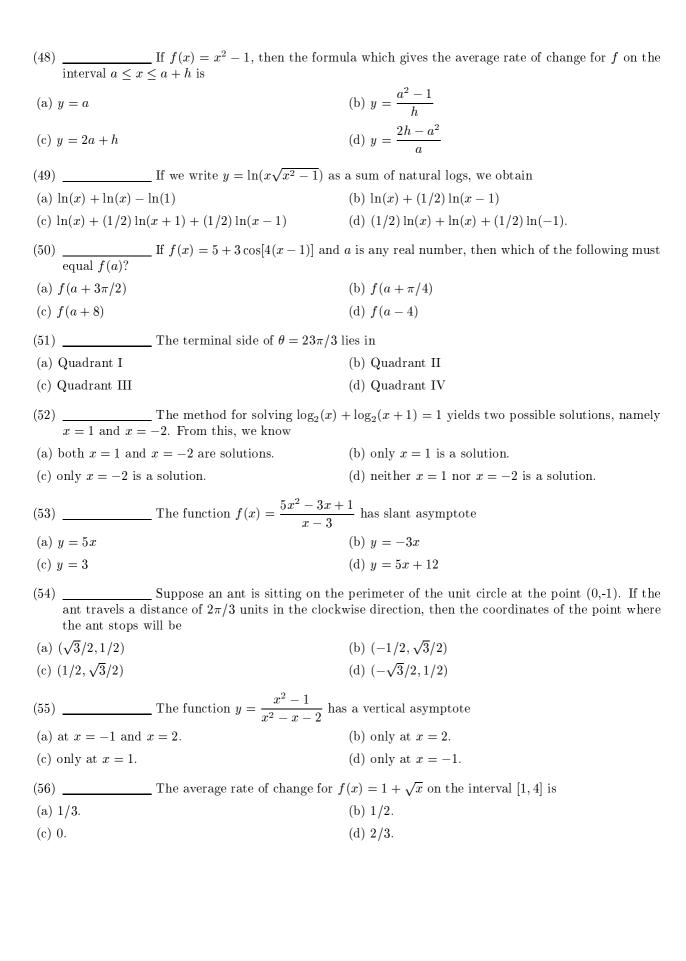
(d)
$$f(x) = 3x + \frac{x-3}{x+3}$$



(19)	If a is a real number, then we kn	now that $a^{4/5}$ is equal to				
(a) $\sqrt[5]{a^4}$		(b) $\sqrt[4]{a^5}$				
(c) $(\sqrt[4]{a})^5$		(d) $\left(\frac{1}{a^5}\right)^4$				
(20)	If we know that $\sec(\theta) = -5/4$,	then we also know that				
(a) $\cos(\theta) = -4/5$		(b) $\sin(\theta) = -4/5$				
(c) $\tan(\theta) = 5/4$		(d) $\cot(\theta) = 5/4$				
(21) Let f be a function defined at $x = a$ and $x = b$. The average rate of change for f between $x = a$ and $x = b$ is						
(a) $\frac{f(a) - f(b)}{b - a}$		(b) $\frac{f(b) - f(a)}{b - a}$				
(c) $\frac{f(a+b) - f(b)}{a-b}$		(d) $\frac{f(b) - f(b-a)}{a}$				
(22)	The inverse of the function $f(x)$	=7x+8 will be				
(a) $g(x) = (x - 8)/(x - 8)$	7	(b) $g(x) = 1/(7x + 8)$				
(c) $g(x) = 8/(x-7)$		(d) $g(x) = -7x - 8$				
(23)	If $sin(A) < 0$ and $tan(A) < 0$, then	en				
(a) $\cos(A) = -\sqrt{1 - (A)^2}$	$-\sin^2(A)$	(b) $\cos(A) = \sqrt{1 - \sin^2(A)}$				
(c) $\cos(A) = \sqrt{\sin^2(A)}$	(A) - 1	(d) $\cos(A) = -\sqrt{\sin^2(A) - 1}$				
Problems 24-26 refe	er to the following function.					
	$f(x) = \begin{cases} 3\\ x - 1\\ 2x - 1 \end{cases}$	$\begin{array}{l} \text{if } x < 2 \\ \text{if } 2 < x \le 4 \\ 5 \text{if } 4 < x \end{array}$				
(24)	The value of $f(0)$ is					
(a) undefined		(b) 3				
(c) 0		(d) -1				
(25)	The value of $f(2)$ is					
(a) undefined		(b) 3				
(c) 1		(d) -1				
(26)	The formula $x-1$ is valid on th	e interval				
(a) [2, 4)		(b) [2, 4]				
(c) $(2,4)$		(d) (2,4]				
$\frac{1}{1}$	If a function f is symmetric with	a respect to the y-axis and (a,b) lies on the graph of f ,				
(a) $(a, -b)$ lies on the	he graph of f .	(b) $(-b, a)$ lies on the graph of f .				
(c) $(-a, -b)$ lies on	the graph of f .	(d) $(-a, b)$ lies on the graph of f .				

(28)	If $f(x) = \sqrt{x}$ and $g(x) = x^2$, the	en $(gf)(x)$ is equal to
(a) \sqrt{x}/x		(b) $ x $
(c) $x^2 \sqrt{x}$		(d) x
eight feet from		com a level sidewalk. When a five-foot woman stands a ten foot shadow. The depression angle between the
(a) exactly 30°.		(b) approximately 26.6° .
(c) approximately 6	3.4°	(d) exactly 43°.
Problems 30-33 refe	er to the function $f(x) = 2 + \cos x$	$\left[3x - \frac{\pi}{2}\right]$.
(30)	The period of the function f is	
(a) 2π		(b) 3
(c) $2\pi/3$		(d) 2
(31)	Compared to the basic cosine fu	f inction, the horizontal translation of f is
(a) $\pi/2$ units right.		(b) $\pi/6$ units right.
(c) 2 units left.		(d) 3 units left.
(32)	The amplitude of the function f	is
(a) π .		(b) 3.
(c) 2.		(d) 1.
(33)	In an interval of width 2π , the f	unction f will complete
(a) three oscillation	S.	(b) two oscillations.
(c) one oscillation.		(d) π oscillations.
(34)	If $f(x) = x^2 - 3$, then $(f \circ f)(2)$	is equal to
(a) 1		(b) -2
(c) $2(x^2-3)^2$		(d) $2(x^2-3)^2-6$
(35)	The maximum value of $f(x) = -\frac{1}{2}$	$-3 + 4\cos(2x + \pi)$ is
(a) -3 .		(b) 2.
(c) 1.		(d) 4.
taut from the t		com a stretch of level ground. A support cable strung gle with the ground. If the cable is three hundred feet
(a) 171 feet		(b) 252 feet
(c) 230 feet		(d) 193 feet
(37)	The reference angle for $\theta = 330^{\circ}$	' is
(a) $A = -60^{\circ}$		(b) $A = 150^{\circ}$
(c) $A = 60^{\circ}$		(d) $A = 30^{\circ}$





(a) About 25 years		(b) About 17.4 years		
(c) About 17.3 years		(d) About 25.2 years		
(58)	If we were to graph the functi	on $y = 3x^2 - 1$ on th	e interval $-1 < x \le 2$, then we	
	circle at $(-1,2)$ and at $(2,11)$		d circle at $(-1,2)$ and at $(2,11)$	
	circle at $(-1,2)$ and an open circle at $(-1,2)$ and an open circle at $(-1,2)$			
	circle at $(-1,2)$ and a closed circle			
	_ The vertex of the parabola y		e point	
(a) $(2,1)$ (c) $(1/2,-1)$		(b) $(-1, -2)$ (d) $(1, 2)$		
·	_ If $f(x) = 5x + 4$, then the inv	. , , , ,		
	m its input, then divide by 5.	(b) divide its input by 5, then subtract 4.(d) subtract 5 from its input, then divide by 4.		
	t by 4, then subtract 5.			
(1) C	(2) D	(3) D	(4) A	
Answers				
(1) C	(2) D	(3) D	(4) A	
(5) B	(6) A	(7) B	(8) B	
(9) A	(10) A	(11) C	(12) A	
(13) D	(14) B	(15) C	(16) D	
(17) A	(18) C	(19) A	(20) A	
(21) B	(22) A	(23) B	(24) B	
(25) A	(26) D	(27) D	(28) C	
(29) B	(30) C	(31) B	(32) D	
(33) A	(34) B	(35) C	(36) D	
(37) D	(38) C	(39) A	(40) A	
(41) D	(42) C	(43) B	(44) B	
(45) A	(46) D	(47) A	(48) C	
(49) C	(50) A	(51) D	(52) B	
(53) D	(54) D	(55) B	(56) A	