November 11, 1997

Math 6
Exam 1

Name _____
Section _____

Show all work. Be neat.

1. Determine the **EXACT** value of the following:

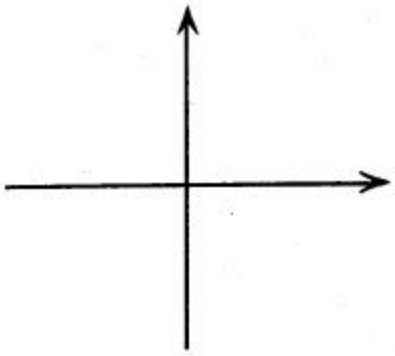
(4) (a) $\csc\left[\arctan\left(-\frac{5}{12}\right)\right]$

(4) (b) $\sin\left[\cos^{-1}\left(\frac{\sqrt{5}}{5}\right)\right]$

2. Sketch one period of $y = 2\sin\left(\frac{1}{3}x - \frac{\pi}{3}\right)$.

(8)

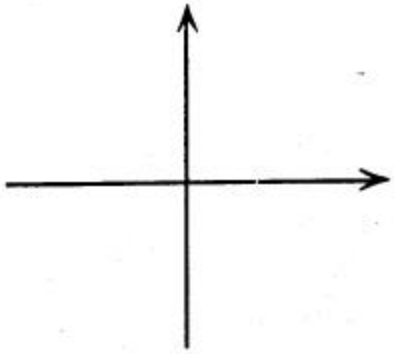
period: _____



3. Sketch $y = \tan\left(3x - \frac{\pi}{4}\right)$ on $[0,\pi]$. Use dashed lines to indicate any asymptotes. Label asymptotes and x-intercepts clearly.

(8)

period: _____



4. Mark answers clearly **TRUE** or **FALSE**.
(20)

_____ (a) $\sin\left(\sin^{-1} x\right) = x$ for all x

_____ (b) $\sin^{-1}(\sin x) = x$ for all x

_____ (c) $\tan(-x) = \tan(x)$

_____ (d) $\csc^{-1} x = \sin x$

_____ (e) $15°26'10'' = 15.436°$

_____ (f) $100°$ is the complement of $-10°$

_____ (g) 1 radian = 2π degrees

_____ (h) $\sin\theta = \frac{1}{2}$ implies $\cos\theta = \frac{\sqrt{3}}{2}$

_____ (i) for $y = \cos\left(2x - \frac{\pi}{4}\right)$, the phase shift is $\frac{\pi}{4}$

_____ (j) $\sec(x)\csc(x) = 1$

5. Convert $32.411°$ to degree-minute-second values.
(4)

6. Let $\theta = 15°$.

(a) Find the complement of θ.

(b) Find the supplement of θ.

(c) Express θ in terms of π radians.

7. (6) Given that $\csc(\theta) = -\frac{\sqrt{58}}{7}$ and $\cos(\theta) > 0$, find

(a) $\tan(\theta)$

(b) $\cos(\theta)$

(c) $\sin(\theta)$

8. (8) Calculate the linear speed in feet per minute of the tip of a 11-inch lawnmower blade when the engine is turning 1500 rpm (revolutions per minute).

9. (5) You are to use a 20 foot plank to create a ramp to a truck bed 2'8" high. What angle will the plank make with the (level) ground? Draw a picture of the situation and label known quantities.

6.2 / 5-2 (9) 10. Suppose A and B are complementary angles.

(a) Draw a right triangle and label angles A and B.

(b) If $\sin(A) = x$, what is $\sin(A)\cos(B)$ in terms of x?

(c) What is $\tan(B)$?

6.3 / 5-3 (5) 11. Write an algebraic expression equivalent to $\sec\left(\tan^{-1}(3x)\right)$.

6.3 / 5-3 (5) 12. Calculate $\cos(81°)\cos(82°)\cos(83°)\cdot\ldots\cdot\cos(100°)$.

6.2 / 5-2 (5) 13. Suppose A and B are supplements. What can be said about the relationship between their respective cosines?