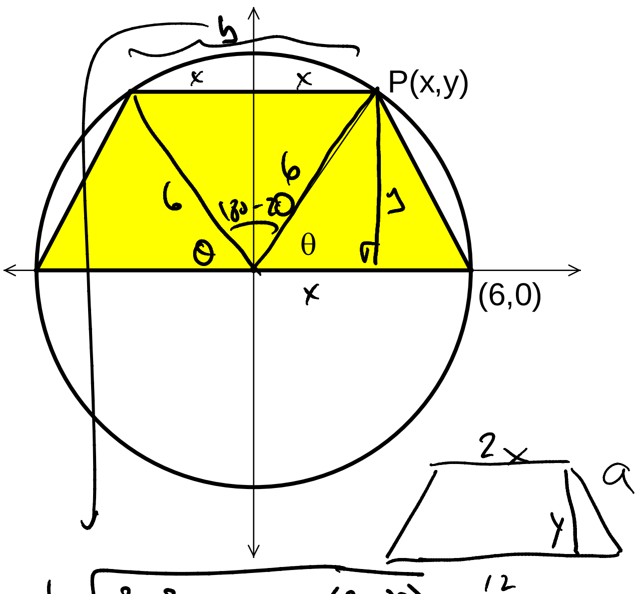
Prefinal Review Day 2 period 6

Tuesday, January 13, 2009
8:45 AM

Announcements:

- **If you miss a final, email or contact me ASAP to schedule your makeup.**
- **Grade corrections are due FRIDAY**
- **IML contest TODAY after school for extra credit!**

$\frac{1}{2}(b_1+b_2)h$ ($b_1 = 12$, $b_2 = 2x$)



Write a formula for the area of the trapezoid…

a. In terms of *x* alone

$x^2+y^2=36$

$y^2=36-x^2 \quad y=\sqrt{36-x^2}$

$a=\frac{1}{2}(2x+12)(\sqrt{36-x^2})$

$2\cdot 6\cos\theta \qquad 36-36\cos^2\theta$

b. In terms of θ alone

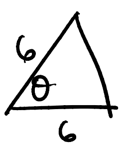
$b=\sqrt{6^2+6^2-2\cdot 6\cdot 6\cos(180-2\theta)}$

$= 12\cos\theta$

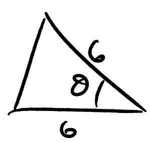
$x=\cos(\theta)\cdot 6$

$y=\sin(\theta)\cdot 6$

$\frac{1}{2}(2((6\cdot\cos(\theta))+12)\cdot\sin(\theta)\cdot 6$

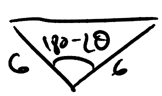


$\frac{1}{2}\cdot 6\cdot 6\cdot\sin\theta$



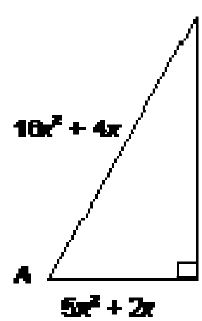
$\frac{1}{2}\cdot 6\cdot 6\cdot\sin\theta$

$\boxed{\frac{1}{2}ab\sin C}$



$= \frac{1}{2}\cdot 6\cdot 6\cdot\sin(180-2\theta)$

35. Let $f(x) = \sec A$, where A is the angle in the triangle depicted at right. Then compute



$\lim_{x\to+\infty} f(x) \longrightarrow f(x)=\frac{16x^2+4x}{5x^2+2x} \longrightarrow \frac{16}{5}$

$\lim_{x\to 0} f(x) \longrightarrow \frac{16x+4}{5x+2} \longrightarrow 2 \text{ as } x\to 0$

36. If $x-2$ is a factor of x^3+ax^2+5x-8, (a) Find the value of a, and (b) find the other factor.

$P(x) = (x-2)(\text{something})$

$P(2)=0$

$P(2) \quad (2-2)\cdot\text{something} = 0.$

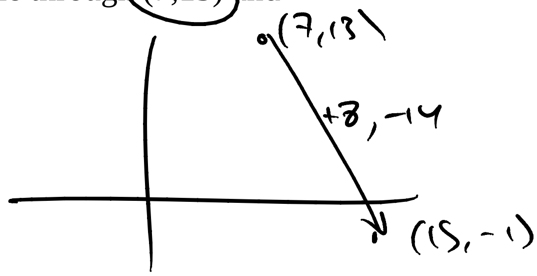
$2^3 + a\cdot 2^2 + 5\cdot 2 - 8 = 0 \Rightarrow a = -5/2$

$t=0$

39. ~~Find~~ parametric equations for the line through (7,13) and (15,-1)

$t=1$

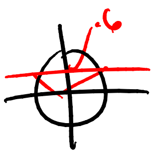
$$\begin{cases} x = 7 + 8t \\ y = 13 - 14t \end{cases}$$



4. Given that $A = 20°$, $a = 5$, and $b = 10$, the number of triangles possible under these conditions is ___.

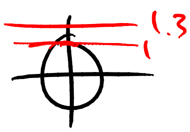
(A) One (B) Two (C) None (D) One, but it must be obtuse

$$\frac{\sin 20^\circ}{5} = \frac{\sin B}{10} \Rightarrow \sin B = \frac{10 \sin 20^\circ}{5} \approx .6$$

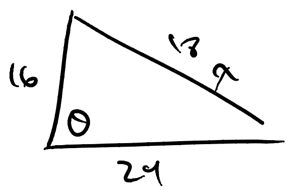


2 solutions for B

$$\frac{\sin 40^\circ}{5} = \frac{\sin B}{10} \Rightarrow \sin B = \frac{10 \sin 40^\circ}{5} \approx 1.3$$



9. The area of an obtuse triangle is 150cm^2, and the lengths of two sides are 16 cm and 24 cm. What are the angles of the triangle?



$$\frac{1}{2} 16 \cdot 24 \cdot \sin\theta = 150$$

$$\sin\theta = \frac{150}{192}$$

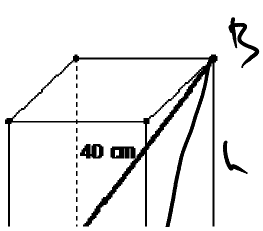
$$\theta = \sin^{-1}\left(\frac{150}{192}\right) \approx 52^\circ$$

or $\theta = 180^\circ - \sin^{-1}\left(\frac{150}{192}\right) \approx 128^\circ$

Hero's Formula ⇒ Equation

$\underline{x \approx 18}$ or $\underline{x \approx 36}$

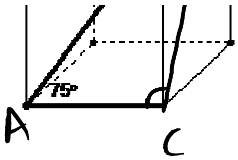
13. A square-base rectangular prism (aka box) has longest diagonal of length 40 cm. If the angle formed by the diagonal and one of the base edges is 75° as shown, compute the volume of the box to the nearest 0.01 cm^3.



$AB = 40$

$AC = 40 \cos 75^\circ$

$BC = 40 \sin 75^\circ$



Need $h = \sqrt{(40\sin 75°)^2 - (40\cos 75°)^2}$

$AC^2 \cdot h =$