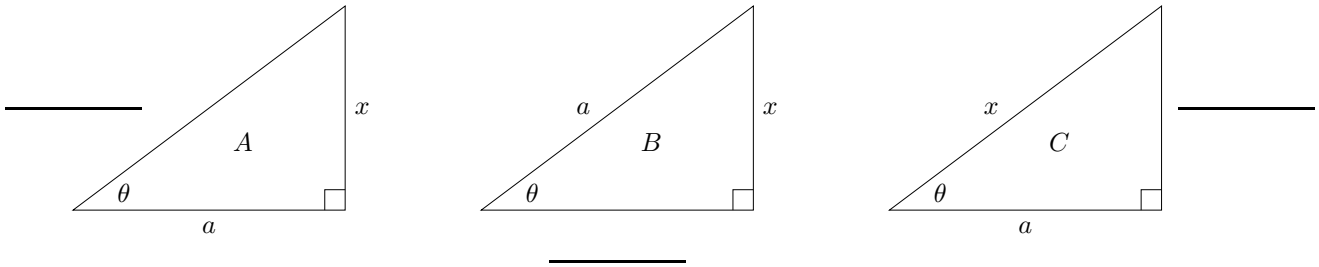
Week 7 Recitation Problems

MATH:114, Recitations 309 and 310

1. Determine the lengths of the missing sides in triangles A, B, and C. You don't need any numbers, just variables!



2. Trigonometric functions define relationships between angles and side lengths. Given an angle θ,

$$\sin\theta = \frac{\text{opposite}}{\text{hypotenuse}} \qquad \cos\theta = \frac{\text{adjacent}}{\text{hypotenuse}} \qquad \tan\theta = \frac{\text{opposite}}{\text{adjacent}}$$

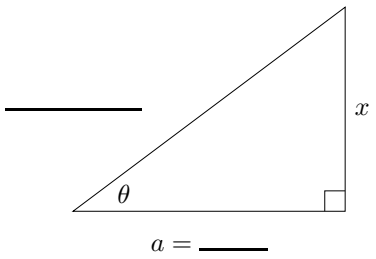
For each of the triangles A, B, and C, express x in terms of a trigonometric function.

3. For each of the triangles A, B, and C, express the length of the missing side using the answers you found in Problem 2. *(Hint: remember your trig identities!)*

4. Use one of the expressions you found in Problem 3 to set up **but not solve** the integral

$$\int \frac{1}{\sqrt{4+x^2}} dx.$$

You can use the triangle below for reference.



5. Solve

$$\int \frac{1}{\sqrt{25x^2-4}} dx$$

using the fact that

$$\int \sec\theta d\theta = \ln|\sec\theta + \tan\theta| + C.$$