**Trig Substitutions**

**For integrals involving:**

Let (1)

This is good because if we make a triangle with sides of a (hypotenuse) and x, the third side is .

Then,

Ex. 1:

Let

Then,

(by solving for in (1))

Ex. 2:

Let

(Let , )

Ex. 3:

We did a substitution here, but it’s really simple. So we don’t need to show it.

*This is acceptable on a test or final.*

See ex 1,2,4 p. 479

**For Integrals Involving or**

If we make a triangle with x and a as (smaller) sides, then is its hypotenuse.

Let . Equivalently or

From this triangle, we derive:

Ex. 4:

Ex. 5:

Let

**For integrals involving**

Let or , ,

Then, ,

Ex. 6:

(See example 5 p481)

**Other Applications**

*Sometimes we don’t have exactly the form we want. Often completing the square will help.*

*This is because we make the root a perfect square by adding and subtracting a specially crafted value.*

See Ex 7 p482-3 for an example of this.