Wednesday, February 4

Clicker Questions

Clicker Question 1

#tbw

If we wanted to use the strategy from Monday on this same integral

$$\int \frac{\sin^5 x}{\cos^8 x}\,dx = \int \sin^5 x\,(\cos x)^{-8}\,dx,$$

which of the following tactics would we employ?

A. write $\sin^5 x\,(\cos x)^{-8} = \sin x\,(1-\cos^2 x)^2(\cos x)^{-8}$ and set $u = \cos x$

B. write $\sin^5 x\,(\cos x)^{-8} = \sin^5 x\,(1-\sin^2 x)^{-4}$ and set $u = \sin x$

C. write $\sin^5 x\,(\cos x)^{-8} = \sin^5 x\,(1-\sin^2 x)^{-4}$ and set $u = \cos x$

D. write $\sin^5 x\,(\cos x)^{-8} = \sin x\,(1-\cos^2 x)^2(\cos x)^{-8}$ and set $u = \sin x$

E. none of the above

Clicker Question 2

Some quadratic polynomials can be factored into two linear polynomials with real numbers as coefficients:

$$3x^2 + 7x - 6 = (x+3)(3x-2)$$

$$x^2 - 5 = (x+\sqrt{5})(x-\sqrt{5})$$

A. when $c \geq 0$

B. when $b^2 - 4ac \geq 0$

C. when $2ax + b \geq 0$

D. always

E. when two of the numbers a, b, c have different signs

In general:

When does the quadratic polynomial $ax^2 + bx + c$ factor into two linear polynomials in this way?

The reason:

$ax^2 + bx + c$ factors this way
$\iff$ it has one or two roots
$\iff$ $\sqrt{b^2 - 4ac}$ is defined (by the quadratic formula)