

# Friday Afternoon Quiz

# Integration 1

Use partial fractions followed by integration by parts

$$\int_0^{\infty} \left[ \frac{x^2 + 3x + 3}{(x+1)^3} \right] e^{-x} \sin x \, dx$$

# Integration 2

By suitably rewriting the numerator of the integrand, find a simplified expression for the following integral.

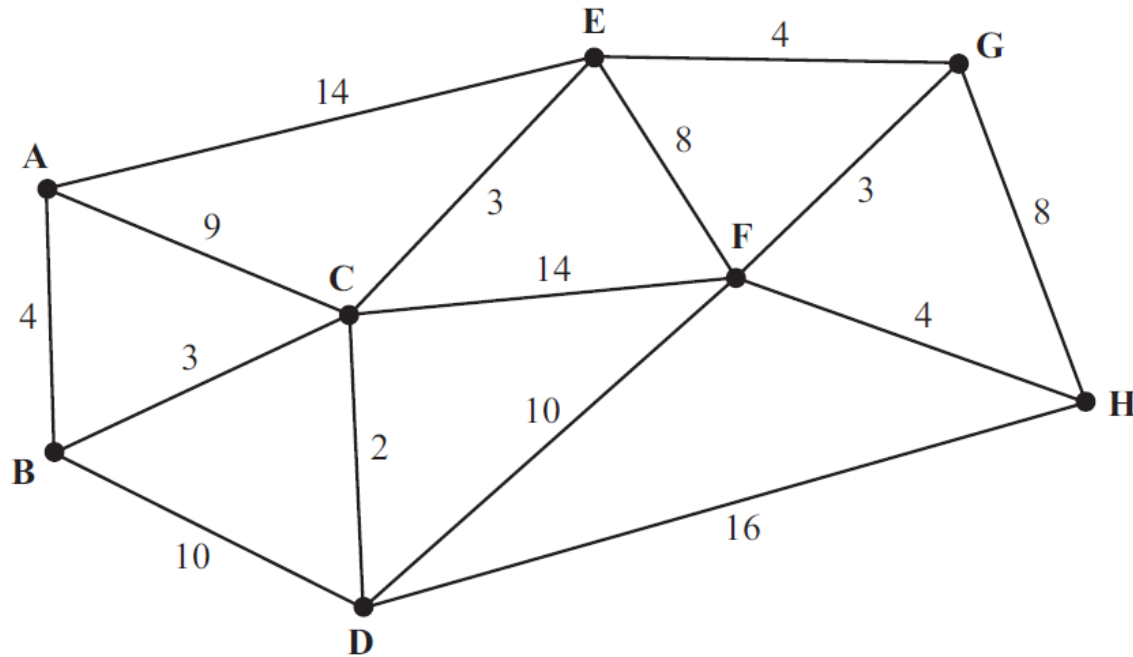
$$\int \frac{3 \cos x + 2 \sin x}{2 \cos x + 3 \sin x} dx .$$

# Integration 3

Use trigonometric identities to find a simplified expression for

$$\int \frac{\sin^8 x - \cos^8 x}{1 - \frac{1}{2} \sin^2 2x} dx .$$

# Decision Maths



**Figure 1**

Figure 1 shows a network of roads between eight villages, A, B, C, D, E, F, G and H. The number on each arc gives the length, in miles, of the corresponding road.

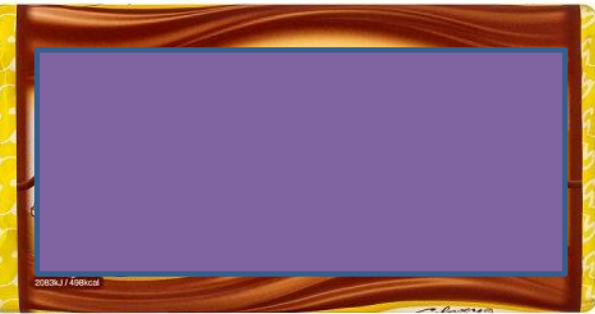
- (a) find the shortest distance from A to H.

# Name the artist



According to one American magazine, they produced some of the best albums in 2019

# Name the chocolate bar



Is this funny?

**A man threw a milk bottle at me today**



**How DAIRY**