Solve for x

$h = b^{2x}$

$\log_b h = 2x$

$\frac{\log_b h}{2} = x$

$2x^2 - 7x + 6 = 0$

$2x \quad -3$

$1x \quad -2$

$(2x-3)(x-2) = 2x^2 - 4x - 3x$

$-7x$

$(2x-3) = 0$

$\boxed{x = \frac{3}{2}}$ and

$x - 2 = 0 \quad \boxed{x = 2}$

$\frac{b - m}{x + 4} = 2$

$b - m = 2x + 8$

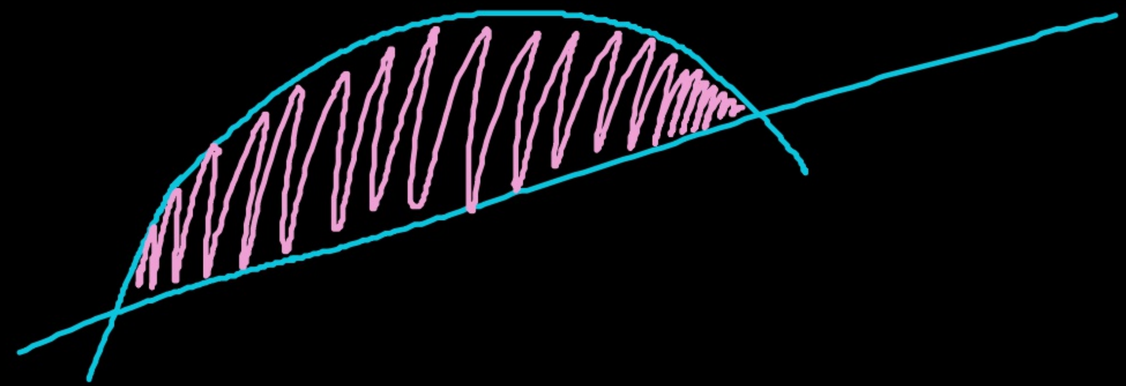
$b - m - 8 = 2x$

$\frac{b - m - 8}{2} = \frac{2x}{2}$

You are an entrepreneur.

Name your business.

Create your logo.



<u>Today's learning objective</u>:

By the end of class, I will be able to calculate the area between two curves with and without technology.

<u>Today's language objective</u>:

dy/dx

$\int f(x)\,dx$

Please graph:

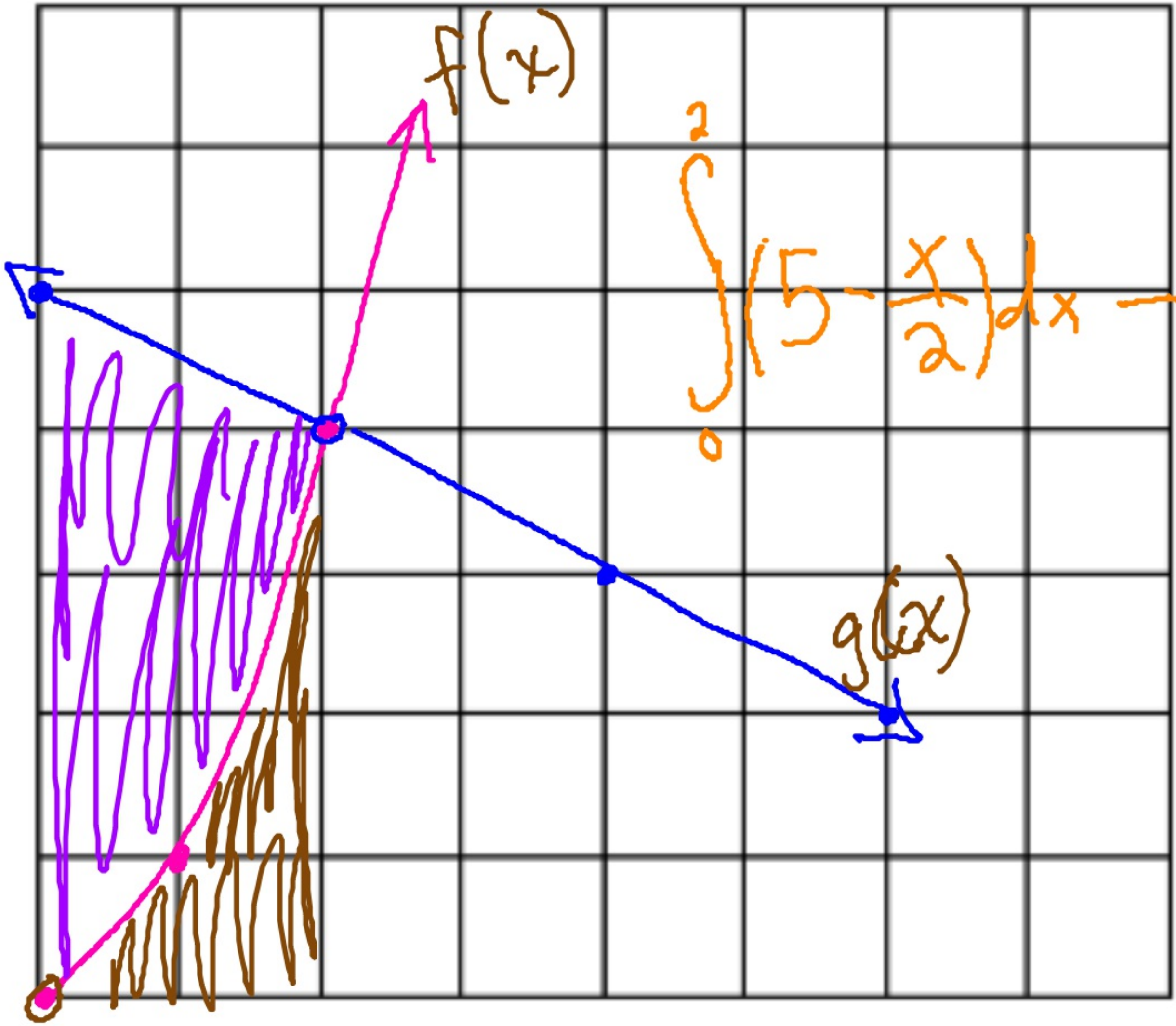
non-calc

$f(x) = x^2$

$-1 \leq x \leq 3$

$g(x) = 5 - \dfrac{x}{2}$

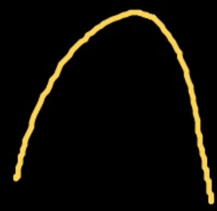
Calculus Nomenclature Expression



$$\int_0^2 \left(5-\frac{x}{2}\right)dx - \int_0^2 x^2\,dx$$

$$\int_0^2 \left(5-\frac{x}{2}\right)dx - \int_0^2 x^2\,dx$$

$$5-\frac{x}{2}-x^2$$



$$\left. 5x-\frac{x^2}{4}\right|_0^2 - \left.\frac{x^3}{3}\right|_0^2$$

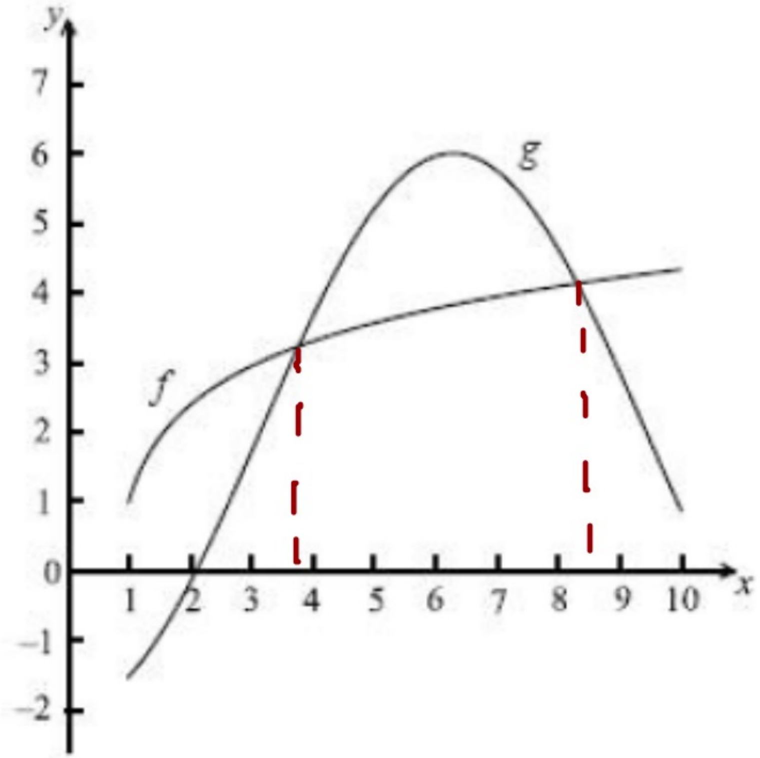
$$(10-1)$$

$$9 \quad - \quad \frac{8}{3}$$

$$\frac{27}{3}-\frac{8}{3}=\boxed{\frac{19}{3}}$$

$\left(\int U\,dx - \int L\,dx\right) \leftarrow$ boundaries are where the 2 curves intersect

25.) The following diagram shows the graphs of $f(x) = \ln(3x - 2) + 1$ and $g(x) = -4\cos(0.5x) + 2$, for $1 \le x \le 10$.



calc

(a) Let A be the area of the region **enclosed** by the curves of f and g.

(i) Find an expression for A.

$$\int_{3.77}^{8.30} \left(-4\cos(0.5x) + 2\right) dx - \int_{3.77}^{8.30} \left(\ln(3x-2) + 1\right) dx$$

(ii) Calculate the value of A. $\boxed{4.64}$ $\ln x \rightarrow \frac{1}{x}$ **(6)**

(b) (i) Find $f'(x)$. $\ln(3x-2)+1$ $\boxed{\frac{3}{3x-2}}$

(ii) Find $g'(x)$. $-4\cos(0.5x)+2$ $\boxed{2\sin(0.5x)}$ **(4)**

(c) There are two values of x for which the gradient of f is equal to the gradient of g. Find both these values of x.

$\underbrace{\text{gradient of } f}_{f'(x)}$ $\underbrace{\text{is equal}}_{=}$ $\underbrace{\text{gradient of } g}_{g'(x)}$

(4)
(Total 14 marks)

Consider the function $f(x) = 1 + e^{-2x}$.

(a) (i) Find $f'(x)$.

(ii) Explain briefly how this shows that $f(x)$ is a decreasing function for all values of x (*ie* that $f(x)$ always decreases in value as x increases).

(2)

Let P be the point on the graph of f where $x = -\frac{1}{2}$.

(b) Find an expression in terms of e for

(i) the y-coordinate of P;

(ii) the gradient of the tangent to the curve at P.

(2)

(c) Find the equation of the tangent to the curve at P, giving your answer in the form $y = ax + b$.

(3)

(d) (i) Sketch the curve of f for $-1 \leq x \leq 2$.

(ii) Draw the tangent at $x = -\frac{1}{2}$.

(iii) Shade the area enclosed by the curve, the tangent and the y-axis.

(iv) Find this area.

(7)

TOK PPFs

Prove that $\sin^2 x + \cot^2 x \sin^2 x = 1$

$$\sin^2 x\left(1 + \cot^2 x\right) = 1$$

$$\sin^2 x \cdot \csc^2 x = 1$$

$$\sin^2 x \cdot \frac{1}{\sin^2 x} = 1$$

Prove that $\sin 3A = 3\sin A - 4\sin^3 A$

$$\sin(\underbrace{2A}_{A}+\underbrace{A}_{B}) = \sin 2A\cos A + \cos 2A\sin A$$