GRAPHICAL SOLUTIONS OF EQUATIONS

Use DESMOS for the following problems:

1 By drawing graphs of the given functions, determine how many solutions exist for the given equation.

(a) $y = x^2, y = 2x - 1$
Equation: $x^2 - 2x + 1 = 0$

(b) $y = x^2, y = 3x + 1$
Equation: $x^2 - 3x - 1 = 0$

(c) $y = x^2, y = x - 4$
Equation: $x^2 - x + 4 = 0$

(d) $y = x^3, y = 2x$
Equation: $x^3 - 2x = 0$

(e) $y = x^3 - x, y = x^2$
Equation: $x^3 - x^2 - x = 0$

(f) $y = e^x, y = x + 2$
Equation: $e^x - x - 2 = 0$

(a) $y = \sin x, y = \frac{x}{2}$
Domain: $-2\pi \le x \le 2\pi$
Equation: $\sin x - \frac{x}{2} = 0$

(b) $y = \log_e x, y = x - 2$
Domain: $0 \le x \le 2\pi$
Equation: $\log_e x - x + 2 = 0$

(c) $y = 2\cos x, y = \log_e x.$
Domain: $0 \le x \le 2\pi$
Equation: $2\cos x - \log_e x = 0$

(d) $y = e^x, y = \sin x$
Domain: $-2\pi < x < 2\pi$
Equation: $e^x - \sin x = 0$

(e) $y = e^{-x}, y = \sin x$
Domain: $-2\pi \le x \le 2\pi$
Equation: $e^{-x} - \sin x = 0$

(f) $y = e^{-x}, y = \tan x$
Domain: $-\frac{\pi}{2} < x < \frac{3\pi}{2}$
Equation: $e^{-x} - \tan x = 0.$

3 Show graphically that the equation $8\log_{10}(0.1x + 0.5) = 2 - x$ has a solution between $x = 2$ and $x = 4$. Find this solution correct to 2 decimal places.