

MATH110 — Assignment 3

Solutions

Question 1.

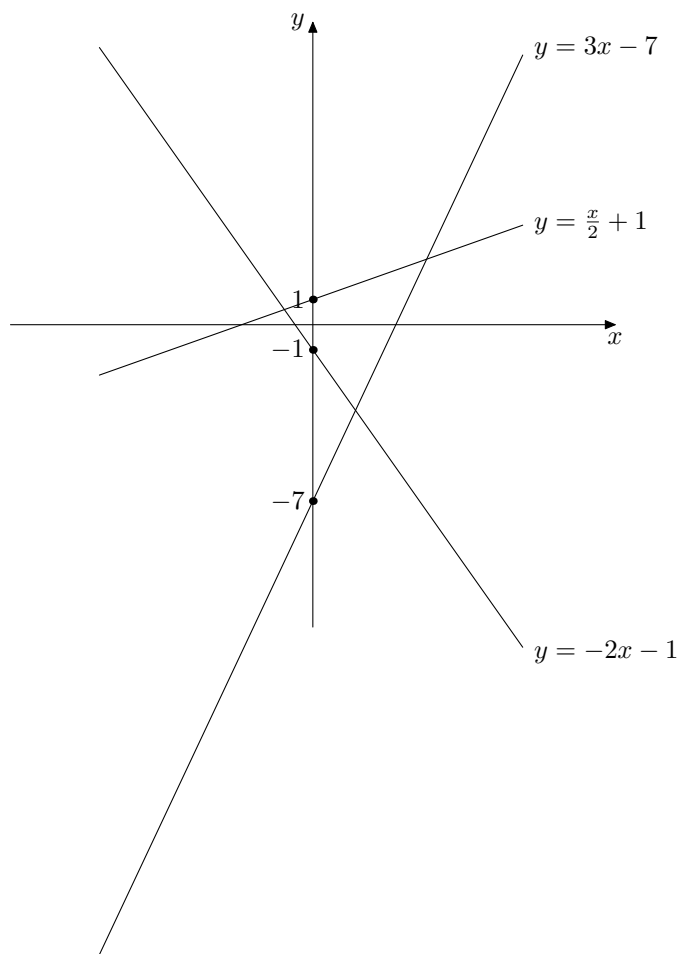


Figure 1: Combined graphs of (a), (b) and (c)

Question 2.

Let $(x_1, y_1) = (2, -3)$ and $(x_2, y_2) = (4, 6)$. Then the slope of the line is

$$b = \frac{y_2 - y_1}{x_2 - x_1} = \frac{9}{2}.$$

Now the line has an equation

$$y = \frac{9}{2}x + a$$

substitute one the points, say (x_1, y_1) into this equation to find a :

$$-3 = \left(\frac{9}{2}\right)2 + a \quad \Rightarrow \quad a = -12.$$

Thus the equation of the line is

$$y = \frac{9}{2}x - 12.$$

Question 3.

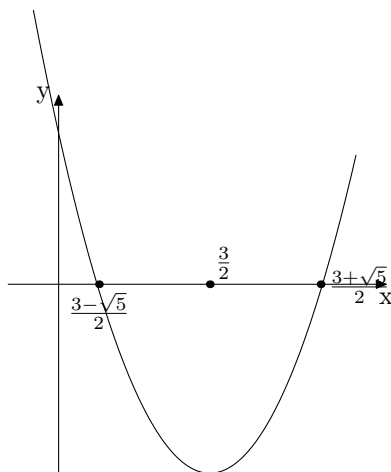


Figure 2: 3(a) Graph of $y = x^2 - 3x + 1$

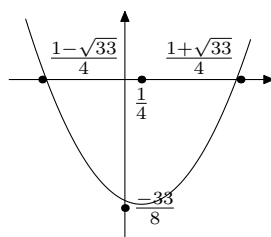


Figure 3: 3(b) Graph of $y = 2x^2 - x - 4$

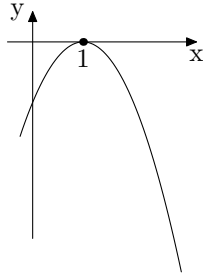


Figure 4: 3(c) Graph of $y = -x^2 + 2x - 1$

Question 4.

(a) $\ln 27 = \ln(3^3) = 3 \times \ln 3 = 3.297.$

(b) $\ln(4/3) = \ln 4 - \ln 3 = 0.287.$

(c) $\ln 48 = \ln(3 \times 4^2) = \ln 3 + 2 \ln 4 = 3.891.$

(d) $\ln 2 = \ln(4^{\frac{1}{2}}) = \frac{1}{2} \ln 4 = 0.693.$