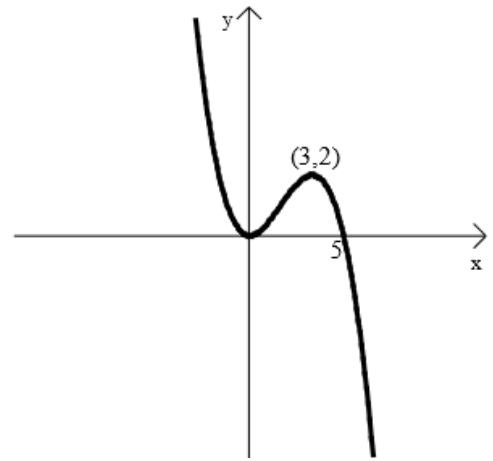


Q1.

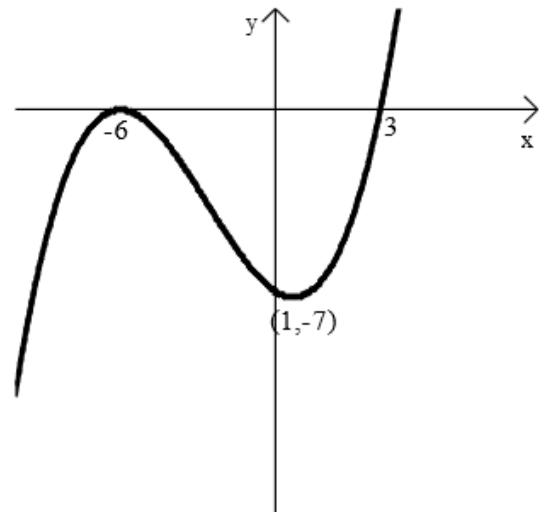
The diagram shows the graph of $y = f(x)$.Sketch the graph of $y = 5 - f(x)$.

Q2.

Part of the graph of $y = g(x)$ is shown.

On separate diagrams sketch the graphs of

- (i) $y = -3g(x)$
- (ii) $y = g(x - 6)$
- (iii) $y = f'(x)$



Q3.

$$f(x) = 2x - 6 \quad g(x) = 4 - 3x \quad h(x) = \frac{1}{6}(2 - x)$$

- (a) $k(x) = f(g(x))$. Find $k(x)$.
- (b) Find a formula for $h(k(x))$.
- (c) What is the connection between h and k ?

Q4. Solve

(a) $2\sin 2x - 1 = 0 \quad 0 \leq x \leq 360$

(b) $5\cos^2 x - 2\cos x - 3 = 0 \quad 0 \leq x \leq 360$

(c) $3\sin 2x = 3\cos x$ for $0 \leq x \leq 360$

Q5. Simplify

(a) $\log_9 12 + \log_9 6 - \log_9 8$

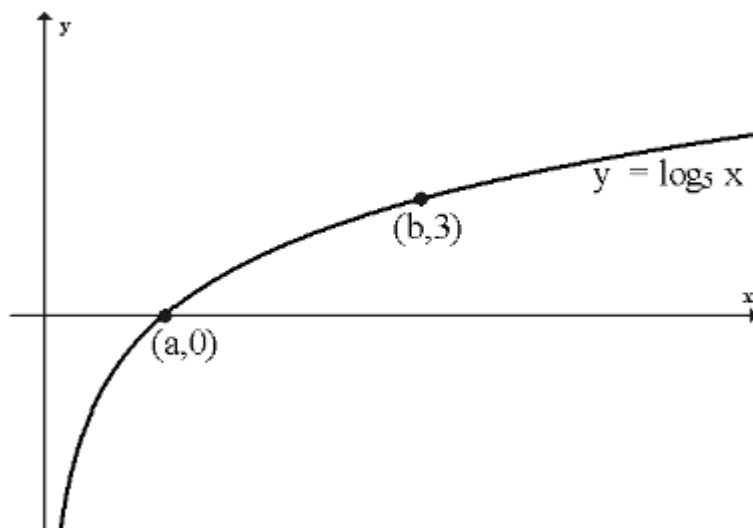
(b) $\frac{2}{3}\log_{10} 8 - \frac{1}{4}\log_{10} 16 + \log_{10} 50$

Q6. Find x in each of the following ($x > 0$)

(a) $2\log_x 4 + \log_x 2 = 5$

(b) $\frac{3}{4}\log_x 81 - 2\log_x 8 = 3$

Q7. Find the values of a and b



Q8.

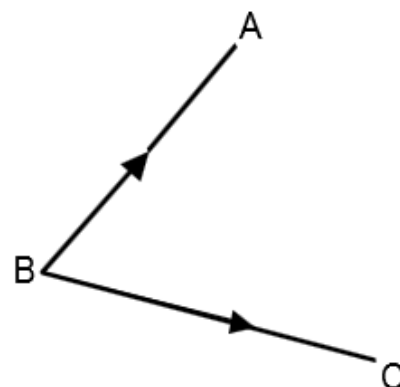
(a) Express $\cos x + \sqrt{3} \sin x$ in the form $k \cos(x - a)$ where $k > 0$ and $0 \leq a \leq 360$.

(b) Hence sketch the graph of $y = \cos x + \sqrt{3} \sin x$ for $0 \leq x \leq 360$.

Q9.

A is the point $(-1, 2, 4)$, B is $(0, 4, 2)$ and C is $(-4, 0, 2)$.

Calculate the size of angle ABC.



Q10.

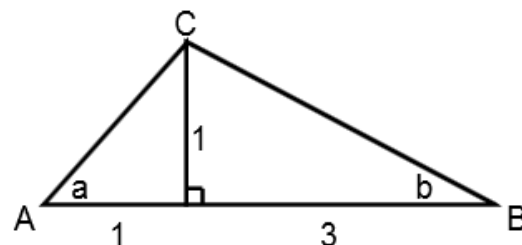
(a) P has coordinates $(2, -1, 4)$ and R has coordinates $(7, 4, -1)$. Q divides PR in the ratio 3:2. Find the coordinates of Q.

(b) T is $(-1, 0, -3)$ and U is $(-10, -3, -9)$. Show that Q, T and U are collinear, stating the ratio of QT:TU.

Q11.

In triangle ABC, show that the exact value of

$$\sin(a + b) \text{ is } \frac{2}{\sqrt{5}}.$$



Q12.

The graph shown has equation $y = a \cos bx + c$. Find the values of a, b and c.

