

## Quiz 4

This quiz is graded out of 10 marks. No books, calculators, notes or cell phones are allowed. You must show all your work, the correct answer is worth 1 mark the remaining marks are given for the work. If you need more space for your answer use the back of the page.

**Question 1.** pg.65#23 (4 marks) Find the distance, and the midpoint of the line segment, between the points:  $(-\frac{1}{4}, \frac{2}{3})$  and  $(\frac{3}{4}, -\frac{1}{3})$ .

$$\begin{aligned}
 d &= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} & (x_m, y_m) &= \left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right) \\
 &= \sqrt{\left(\frac{3}{4} - \left(-\frac{1}{4}\right)\right)^2 + \left(-\frac{1}{3} - \frac{2}{3}\right)^2} & &= \left( \frac{-\frac{1}{4} + \frac{3}{4}}{2}, \frac{\frac{2}{3} - \frac{1}{3}}{2} \right) \\
 &= \sqrt{(-1)^2 + (-1)^2} & &= \left( \frac{\frac{2}{4}}{2}, \frac{\frac{1}{3}}{2} \right) \\
 &= \sqrt{2} & &= \left( \frac{1}{4}, \frac{1}{6} \right)
 \end{aligned}$$

**Question 2.** pg.67#48 (2 marks) Find the equation of the circle with center  $(0, -5)$  and radius  $2\sqrt{3}$

$$\begin{aligned}
 (x-h)^2 + (y-k)^2 &= r^2 \\
 (x-0)^2 + (y-(-5))^2 &= (2\sqrt{3})^2 \\
 x^2 + (y+5)^2 &= 12
 \end{aligned}$$

**Question 3.** pg.75#58 (4 marks) Find  $\frac{f(x+h)-f(x)}{h}$ .

$$\begin{aligned}
 f(x) &= \frac{10}{x} + 2 \\
 \frac{f(x+h)-f(x)}{h} &= \frac{\frac{10}{x+h} + 2 - \left[\frac{10}{x} + 2\right]}{h} \\
 &= \frac{\frac{10}{x+h} - \frac{10}{x}}{h} \quad \text{LCD} = x(x+h) \\
 &= \frac{\frac{10x}{x(x+h)} - \frac{10(x+h)}{x(x+h)}}{h} \\
 &= \frac{10x - 10x - 10h}{x(x+h)h} \\
 &= \frac{-10h}{h(x+h)x} \\
 &= \frac{-10}{(x+h)x}
 \end{aligned}$$