Higher Maths – Homework 3

1. If the straight line joining the points (0,8) and (-4,0) passes through the point (p,-4), then p is equal to

   A -8 B -6 C 2 D 6

2. The exact value of $\tan \frac{5\pi}{6}$ is

   A $\sqrt{3}$ B $-\sqrt{3}$ C $-\frac{1}{\sqrt{3}}$ D $\frac{1}{\sqrt{3}}$

3. The x-coordinate of the point at which the curve $y = 10 - 2x^2$ has gradient 8 is

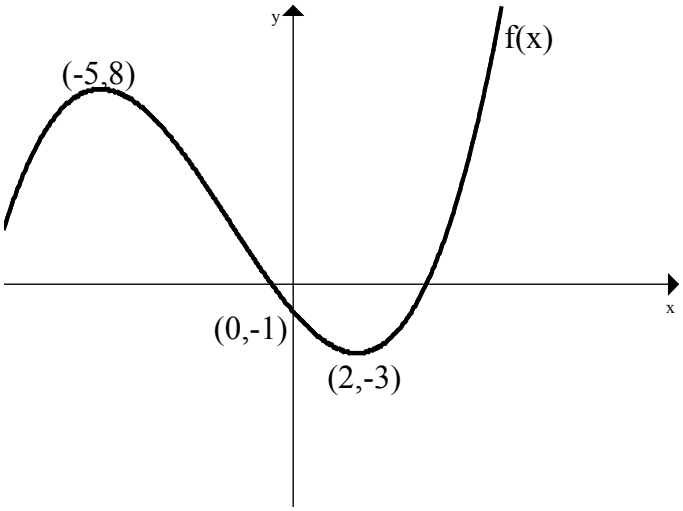
   A 2 B -2 C $\sqrt{2}$ D $-\sqrt{2}$

4. Find the equation of the line passing through the point (3,-1) which is parallel to the line with equation $3x + 2y = 4$.

5. Given $f(x) = \frac{x^3 - 8x}{\sqrt{x}}$, find $f'(x)$.

6. The graph of $y = f(x)$ is shown opposite.

   Sketch the graph of $y = -f(x - 3)$.



7. Solve the equation $4\cos 3x° + 7 = 6$, $0° \leq x° \leq 180°$.

8. Find the equation of the tangent to the curve $y = 2x(x - 4)$ at the point where $x = 3$.

9. A triangle ABC has vertices A(2,5), B(4,-1) and C(10,5).

   (a) Write down the equation of the perpendicular bisector of AC.
   (b) Find the equation of the altitude CD.
   (c) Find the point of intersection of these two lines.

10. $f(x) = \frac{x - 5}{x}$ and $g(x) = 3x - \frac{12}{x}$

   (a) Show that $f(g(x)) = \frac{(3x + 4)(x - 3)}{3(x - 2)(x + 2)}$

   (b) State a suitable domain for f(g(x)).

11. In the diagram opposite OABC is a kite with B(4,3).
   Find the gradient of the line OC.