MA1M01 Calculus Assignment 1 Michælmas term week 3

www.maths.tcd.ie/pub/MA1M01/Calculus/

1. Consider the functions:

$$f(x) = 2x + 1, v(t) = \frac{\sqrt{t}}{2}, m(z) = \frac{1}{z}$$

- (a) [5 points] Compute f(-3), v(16), m(10).
- (b) [5 points] Write down f(y), v(9t), m(2a).
- (c) [10 points] For which real numbers are the above functions defined?
- (d) [20 points] Draw the graphs of the above functions.
- 2. Find the slope-intercept of the following:
 - (a) **[10 points]** The straight-line which passes through the point (3, 5) and is perpendicular to the graph of y = 2x + 3.
 - (b) [10 points] The straight-line which passes through the point (3, 5) and and has the same slope as y = -3x + 2.
- 3. You have been offered a voucher for a shop: you can buy any article for 25% off. When you arrive at the shop, you realise that there is also a discount of 20 euro.
 - (a) [5 points] If p is the original price and y is the price after using the voucher (only), write the function f such that y = f(p). Next, if p is the original price and y is the price using the 20 euro disount (only), write the function g such that y = g(p).
 - (b) [10 points] Write down a function m which gives you the price you will have to pay if you first use the voucher and then the 20 euro discount. What is m in terms of f and g?
 - (c) **[10 points]** In the case described in part *b*), if you pay 75 euro, what was the original price?
 - (d) **[15 points]** Do parts b) and c) for the case where you use the discount first.