

Math 150 – Calculus I

Pre-course test

August 31, 2023; Time: 50 minutes

Your Name:

Your Student ID:

1. Algebra:

(a) Evaluate the following expressions.

i. 3^{-4}

ii. $\frac{5^{23}}{5^{21}}$

iii. $16^{-3/2}$

(b) Factor the following expressions.

i. $4x^2 - 25$

ii. $x^3 - 3x^2 - 4x + 12$

(c) Use polynomial long division to simplify the following rational expression.

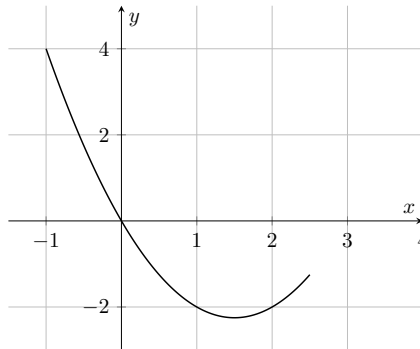
$$\frac{3x^3 + 10x^2 + 13x + 14}{x^2 + x + 2}$$

(d) Solve the following inequalities.

i. $x^2 < 2x + 8$

ii. $-4 < 5 - 3x \leq 17$

2. **Functions:** The graph of a function is given below.



(a) State the value of $f(1)$.

(b) For what values of x is $f(x) > 0$?

(c) Estimate the domain and range of f .

3. Analytic geometry:

(a) Find the equation of the line with slope -3 and that passes through the point $(2, -5)$.

(b) Find the equation of a circle that has center $(-1, 4)$ and that passes through the point $(3, -2)$.

4. Trigonometry:

(a) Convert 300 degrees to radians.

(b) Convert $\pi/4$ radians to degrees.

(c) Find the values of $\tan(\pi/3)$ and $\sin(\pi/6)$.