Name:
Group A
Result:

1. [7 *points*]

Solve for x:

a) $\log_9(x-2) = -\frac{1}{2}$

b) $16^{x+1} = \left(\frac{1}{2\sqrt{2}}\right)^{2x-4}$

c) $\log_2(x-4) - \log_2(x+1) = -1$

d) $3^{2x+1} + 5 \cdot 3^x = 2$

e) $\log_2 x + \log_2(x-2) = 3$

2. [3 *points*]

If $\log_3 2 = P$ and $\log_3 5 = Q$, write in terms of P and Q:

a) $\log_3 20 =$

b) $\log_3 0.08 =$

c) $\log_3 90 =$

3. [2 *points*]

Tomasz invests 5000PLN into an account that pays 6% per annum compounded quarterly.

a) Find the value of his investment after 6 years.

b) How many quarter will it take for the investment to double in value?

4. [2 *points*]

Population of a certain town in t years after 2021 is given by the formula:

$$P(t) = 16000 \cdot (1.07)^t$$

a) The population increases by p% each year. State the value of p.

b) In which year will the population reach 30000?

5. [3 *points*]

The value of a certain car deceases by 12% each year. The car is now valued at 65 000 PLN.

a) Estimate the value of the car in 5 years.

b) How long will it take for the value to drop below 10 000 PLN?

6. [3 *points*]

Radium-204 has a half life of 4 milliseconds. Starting with 2 grams of Radium-204:

a) How much will be left after 4 milliseconds?

b) How much will be left after 8 milliseconds?

c) How long will it take for the amount of radium to decay by 10%.