

**ALGEBRA 2**  
**PROBLEM SET 6**

DUE DATE: FEBRUARY 29, 2024

**Question 1** (6 marks). Write each of the following as a power of 2, e.g. write 2 as  $2^1$ .

(a)  $2 \times 2^{-4}$

(b)  $\frac{16}{2^{-3}}$

(c)  $8^5$

(d)  $32$

(e)  $\frac{1}{32}$

(f)  $8^x \times 4$

**Question 2.** Simplify  $\sqrt{108}$  and  $\sqrt{875}$  using prime factorization.

**Question 3.** Simplify the expression  $((2a)^{1/3}(a^2b)^{1/3})^3$ .

**Question 4.** Solve for  $x$  in the equations:

(a)  $2^{x-1} = \frac{1}{8}$

(b)  $4^{2x-1} = \frac{1}{2}$

(c)  $8^{1-x} = \frac{1}{4}$

(d)  $3 \cdot 2^x = 24$

(e)  $2^x \cdot 8^{1-x} = \frac{1}{4}$

**Question 5.** Without a calculator, compute  $125^{-2/3}$  and  $32^{2/5}$ .