Çankaya University
Department of Mathematics
2021 - 2022 Fall Semester

MATH 103 - General Mathematics

First Midterm Examination

1) Simplify the following expressions:

a) $\sqrt{2400}$

b) $\dfrac{16}{(\sqrt{2})^5}$

c) $\dfrac{x^4y^5}{(2xy)^2}$

2) Open the parentheses and simplify the following expressions:

a) $\big(3x+2y\big)^2$

b) $(5x+6)(5x-6)$

c) $(x^2+3x+1)(2x+1)$

3) Factor the following expressions:

a) $x^2+16x+64$

b) $x^2-16x+63$

4) Find x:

a) $25x+30=205$

b) $\dfrac{3x-1}{2x+8}=\dfrac{4}{5}$

5) Find x:

a) $x^3+8=15$

b) $\big|3x-6\big|=18$

ANSWERS

1) a) $\sqrt{2400} = \sqrt{24} \cdot \sqrt{100} = 20\sqrt{6}$

b) $\dfrac{16}{(\sqrt{2})^5} = \dfrac{2^4}{2^{5/2}} = 2^{3/2} = 2\sqrt{2}$

c) $\dfrac{x^4y^5}{(2xy)^2} = \dfrac{x^2y^3}{4}$

2) a) $\big(3x + 2y\big)^2 = 9x^2 + 12xy + 4y^2$

b) $(5x + 6)(5x - 6) = 25x^2 - 36$

c) $(x^2 + 3x + 1)(2x + 1) = 2x^3 + 7x^2 + 5x + 1$

3) a) $x^2 + 16x + 64 = (x + 8)^2$

b) $x^2 - 16x + 63 = (x - 7)(x - 9)$

4) a) $25x + 30 = 205 \quad \Rightarrow \quad x = \dfrac{205 - 30}{25} = 7$

b) $\dfrac{3x - 1}{2x + 8} = \dfrac{4}{5} \quad \Rightarrow \quad 15x - 5 = 8x + 32 \quad \Rightarrow \quad x = \dfrac{37}{7}$

5) a) $x^3 + 8 = 15 \quad \Rightarrow \quad x = 7^{1/3}$

b) $\big|3x - 6\big| = 18$

$\Rightarrow \quad 3x - 6 = 18 \quad$ or $\quad 3x - 6 = -18$

$x = 8 \quad$ or $\quad x = -4$