TOI-OHOMAI Institute of Technology	**COMP.5202** **Fundamentals of** **Programming and Problem** **Solving**	**Mathematics** **Algebra**

Algebra Review Questions

A. Simplify the following:

1. $x^2 + 7x + 2x^2 - 4x$

2. $3bx^2 - 8 + 5ay + 9bx^2 - 2ay + 6$

3. $a^3b^2 + a^2 - 4b^2 + 5a^3b^2 + 5b^2$

4. $6t^2 + 7 + 3a^2z - 2t^2 - 1 - 5a^2z$

5. $2py + 4y^2 - 4 + 2p - 2y^2 - 3 - 5py$

B. <u>Simplify the following by removing the brackets:</u>

1. $3yp^2(5y^2p^4)$

2. $-2pc(3c - 8p)$

3. $(-3y + 2)(3 - 2y)$

4. $(3ax + 4)(3 - 4x)$

5. $y(4 - y) + 3(4 + 2y) + (y - 1)^2$

C. **Simplify the following:**

1. $\dfrac{-9c^6}{6c^3}$

2. $\dfrac{20x^3y^6}{-5x^5y^2}$

3. $\dfrac{9p^4 - 6p^2}{3p}$

4. $\dfrac{10x^2 - 4x^3}{-2x}$

5. $\dfrac{12c^3y^2 - 20c^4y - 8c^5y^3}{-4c^2y}$

D. <u>Factorise the following by finding the common factors:</u>

1. $-10bx^2 - 5ax$

2. $3p + 12p^2 - 6pq$

3. $16xy - 32x + 8axy$

4. $-2xy + 14y^2$

5. $3y^3 - 9b^3$

6. $3y^3z - 9ay^2 + 12by^3 + 6cy^2$

E. Factorise the following by grouping:

1. $4px + 2ax + 6p + 3a$

2. $6x^2 - 4x + 9x - 6$

3. $12xy + 9y - 8x - 6$

4. $3ax + 4bx - 6ay - 8by$

5. $6ap^2 - 9p - 4a^2p + 6a$

F. Solve the following Linear Equations to find the value of x:

1. $2x - 13 = 17$

2. $3 - \dfrac{2x}{5} = -5$

3. $\dfrac{5x}{2} - 6 = 4$

4. $4 + 2x = -2x$

5. $3x - 10 = -2x + 5$

6. $30 = 7x + 3x$

G. Factorise the following Quadratic equations:

1. $x^2 + 4x - 21$

2. $x^2 - 3x - 54$

3. $x^2 - 36$

4. $x^2 - 17x$

5. $x^2 + 22x + 72$

6. $x^2 - 22x + 121$

H. Solve the following quadratic equations to find the values of x (ie. find the "roots"):

1. $x^2 - 6x - 27 = 0$

2. $x^2 - 2x = 24$

3. $x^2 = 144$

4. $x^2 = 22x$

5. $x^2 + 49 = -14x$