Show all your work to get full/partial credit. Simplify your answers as much as possible. Each problem is worth 5 points. Kindly accept reasonable alternative solutions.

1) Write $A = \{X \mid -2 \leq X < 3\}$ in an interval notation and graph it

Q5B

The set $A$ is written as $[-2, 3)$ in interval notation

2) Multiply and simplify $(5a^2 - 1)(3a^2 + 2)$

Q6B

Multiply and simplify $(5a^2 - 1)(3a^2 + 2)$.
- $5a^2(3a^2 + 2) - 1(3a^2 + 2)$
- Simplify to get $15a^4 + 7a^2 - 2$

For # 3-5, factor completely.

3) $2x^2 - 6x - 8$

Q1B
- GCF of 2
- Factorize as $2(x + 1)(x - 4)$

4) $9x^2 - 16$

Q2B
- Write the polynomial as difference of two squares $(3x)^2 - (4)^2$
- Write the difference of squares as $(3x + 4)(3x - 4)$

5) $x^3 + 4x^2 - x - 4$

Q3B
- Grouping polynomial into two
- Factoring GCF from each group
- Completely factorizing polynomial as $(x + 1)(x - 1)(x + 4)$
6) Express \((5 \times 24000)\) in scientific notation

**Q4B**

- \(5 \times 24000 = 100000\)
- \(1200000 = 1.2 \times 10^5\)

7) For the polynomial \(2x^3 - 3x^6 + 5x - 4\), find the

**Q19B**

a.) degree
   a. Rearrange the polynomial in descending order \(-3x^6 + 2x^3 + 5x - 4\)
   b. State the degree of the polynomial as 6
   c. leading coefficient
   d. Coefficient of the leading term is -3

8) For \(\left(\frac{3}{x-2}\right) \left(\frac{x^2-4}{x+7}\right)\)

**Q20B**

a) Identify restricted values
   - Restricted values are \(x \neq 2\) and \(x \neq -7\)

b) simplify
   a) simplify
      Factor the numerator
      Simplify the fraction to get \(3(x + 2)/x + 7\)

For #9-11, solve for \(x\).

9) \(9(x - 1) - 3(2x + 1) = 0\).

**Q7B**

- Use the Distributive Property to remove parenthesis
- Group like terms
- Solve to get \(x = 4\)

10) \(\frac{2}{4} - \frac{3}{x} = \frac{1}{2x}\)

**Q8B**

- Finding the LCD to be 4x
- Multiply both sides by the LCD
- Group like terms and solve
• \( x = 7 \)

11) \( 4y + 2xy = 8 \)

Q9B
• Add \(-4y\) to both sides of the equation
• group like terms and simplify to get \(2xy = 8 - 4y\)
• make \(x\) the subject on the LHS and arrive at \((8 - 4y)/2y\)

For # 12-20 simplify the expressions

12) \(2x^2y + xy^2 - 3x^2y\)

Q10
• group like terms to get \(2x^2y - 3x^2y + xy^2\)
• simplify and write the final answer as \(-x^2y + xy^2\)

13) \(2[3x - 2(x - 3)]\)

Q11
• expand and remove inner parenthesis to get \(2[3x - 2(x - 3)] = 2[3x - 2x + 6]\)
• 2 expand and remove brackets \(2[3x - 2x + 6] = 6x - 4x + 12\)
• simplify and write the final answer as \(2(x + 6)\)

14) \(\frac{3+|3-7|}{2(1-4)^2}\)

Q12B
• \(|3 - 7| = | - 4|\)
• \((1 - 4)^2 = (-3)^2\)
• Simplify the fraction to get \(\frac{3+4}{2(9)} = \frac{7}{18}\)

15) \(\frac{2}{x+3} - \frac{1}{x+1}\)

Q13B
• Find the LCD, which is \((x + 3)(x + 1)\)
• write the fractions with the same LCD
• simplify the fractions to get \(\frac{x-1}{(x+3)(x+1)}\)
16) \[
\frac{1 + \frac{2}{3}}{\frac{1}{3} - \frac{2}{3x}}
\]

**Q14B**
- find LCD for the fractions above and below
- simplify the fractions with common LCD
- write your final answer as \((3x + 2) / (x - 2)\)

Leave your answers in positive exponents.

16) \((-2x)^{-2}(4x^2y^{-1})^3\)

**Q15B**
- distribute the exponents over the parenthesis
- multiply and simplify the expression to get \(-16x^4y^{-3}\)
- Write your final answer with positive exponent as \(-16x^4y^{-3}\)

18) \[
\frac{25x^5y^3}{5x^7y^6}
\]

**Q16B**
- Use the quotient rule of indices and simplify to reduce the expression to \(5x^{5-7}y^3 = 5x^{-2}y^3\)
- write the answer in positive exponent as \(\frac{5y^3}{x^2}\)

19) \[
\sqrt[3]{4x^2y} \cdot \sqrt[3]{2x^2y^3}
\]

**Q17B**
- write the expression under a single radicand and simplify to get
  \[
  \sqrt[3]{(4x^2y)(2x^2y^3)} = \sqrt[3]{8x^{2+2}y^{3+1}} = \sqrt[3]{8x^4y^4} = (8x^4y^4)^{\frac{1}{3}}
  \]
- distribute the exponent over each term in the parenthesis to get
  \[
  \frac{1}{8^3x^{3(4)}} \cdot \frac{1}{y^{3(4)}} = \frac{4}{x^3y^3}
  \]

Accept alternative method

20) \((8)^{2/3}\).

**Q18B**
- write \((8)^{2/3}\) as \((8)^{\frac{1}{3}(2)} = (\sqrt[3]{8})^2 = 2^2 = 4\)