

**Question 1:**

(a)[3 points] Expand and simplify:

$$(t - 5)^2 - 2(t + 3)(8t - 1)$$

(b)[3 points] Write as a single simplified fraction:

$$\frac{2}{a^2} - \frac{3}{ab} + \frac{4}{b^2}$$

(c)[4 points] Simplify:

$$\frac{x}{x + \frac{x}{1+x}}$$

Question 2:

(a)[3 points] Factor:

$$x^2 - 2x - 8$$

(b)[4 points] Factor

$$8x^2 + 10x + 3$$

(c)[3 points] Factor

$$4t^2 - 9s^2$$

**Question 3:**

(a)[4 points] Simplify

$$\frac{x^3 + 5x^2 + 6x}{x^2 - x - 12}$$

(b)[3 points] Complete the square:

$$x^2 - 16x + 80$$

(c)[3 points] Simplify:

$$\left(\frac{y^5 z^{-15}}{x^3}\right)^{3/5}$$

**Question 4:**

(a)[3 points] Solve for  $x$ :

$$2x^2 + 7x + 2 = 0$$

(b)[4 points] Rationalize the numerator:

$$\frac{\sqrt{2+h} + \sqrt{2-h}}{h}$$

(c)[3 points] Simplify:

$$\sqrt[4]{r^{4n+1}} \sqrt[4]{r^{-1}}$$

**Question 5:**

**(a)[5 points]** Solve the inequality and state your solution using interval notation:

$$x^2 < 2x + 15$$

**(b)[5 points]** Solve and state your solution using interval notation:

$$|5x + 2| < 6$$