	Score
1	/24
2	/21
3	/7
4	/12
5	/6
6	/12
7	/10
8	/10
Total	/100

- No books or notes (in any form) allowed.

- You may use a calculator.

- Clearly indicate your answers.

- **_Show all your work_** – partial credit may be given for written work.

- Good Luck!

1. (24 pts). Factor _completely_.

(a). $6a - 3a^2 - 4b^2 + 2ab^2$ [By grouping]

(b). $2x^3 - 8x^2 + 8x$

(c). $10x^2 - 19x + 6$

(d). $x^4 - 64y^4$

2. (21 pts). Perform the indicated operations and simplify into a single fraction in lowest terms.

(a). $(x^2 + x - 6) \cdot \dfrac{x^2 - 3x}{9 - x^2}$

(b). $\dfrac{4x + 4}{x - 4} \div \dfrac{8x^2 + 8x}{x^2 - 6x + 8}$

(c). $\dfrac{2x + 1}{2x - 1} + \dfrac{5}{2x} - \dfrac{x + 4}{2x^2 - x}$

3. (7 pts). Simplify the complex fraction
$$\dfrac{\dfrac{2x}{3} - \dfrac{x+4}{5}}{\dfrac{1}{2} + x}$$

4. (12 pts). solve the following equations for x.

(a). $2x + 3 - (x+1) = 2(2-3x)$

(b). $\dfrac{2x}{x-3} = 4 + \dfrac{6}{x-3}$ [Check your answer.]

5. (6 pts). In its second year of operation, a small company has a profit of \$240,800. If this amount was 312% of the company's first-year profits, find the first- year profits (rounded to the nearest whole dollar).

6. (12 pts). A child hits a ball through the neighbor's window requiring \$295 for repairs. Since the child does not have a job to pay for the repairs, the neighbor will decrease the debt by \$15 for each hour the child helps him with chores.

(a). Write an expression for the amount of debt still owed after x hours of work.

(b). How much debt is left if the child has worked 3.25 hours?

(c). If there is only \$50 dollars left of the debt, how many hours has the child worked?

7. (10 pts). If $f(x) = 3 - x^2$, find the following and *simplify*.

(a). $f(-4)$

(b). $f(x+h) - f(x)$

8. (10 pts). Given $f(x) = 2\sqrt{x}$ and $g(x) = x^2 + 3$, find the following and *simplify*.

(a). $(f - g)(x)$

(b). $(g \circ f)(x)$