DAWSON COLLEGE
MATHEMATICS DEPARTMENT

FINAL EXAMINATION
Winter 2025

Remedial Activities for Secondary IV Mathematics
201-016-RE

Instructor: G. Chu

Student Name:_____

Student I.D.:_____

Date: May 21, 2025 Time: 14:00 – 17:00

Instructions:

- Print your name, student ID number and section in the space provided above.
- All questions are to be answered directly on the examination paper.
- Only calculators SHARP EL-531 are permitted.
- Please show all your work clearly.
- Please justify all your answers.
- Your answers must be exact and simplified unless otherwise stated.

All questions are equally weighted.
This exam must be returned intact.

1. Simplify $\frac{x^2(2x^2y)^{-5}}{4x^6}$ with positive exponents only.

2. Expand and simplify: $2x(2x-5)^2 - 8(x^3+7x)$

3. Simplify $\frac{4x^2+8x+3}{x^3-27} \div \frac{2x^2+14x+3x+21}{x^2+4x-21}$

4. Simplify $\frac{x-2}{5x-35} + \frac{x}{x^2-49}$

5. Rationalize the denominator and simplify the expression: $\frac{48}{\sqrt{12}-2}$

6. Solve for x: $x = \sqrt{2x + 17} - 7$

7. The sum of 4 consecutive negative odd numbers is -136. Find the numbers.

8. The sum of two numbers is 6 and double their difference is 56. Find the numbers.

9. The sum of a number and double its square is 55. Find the number(s).

10. The sum of a number and double its reciprocal is $\frac{33}{4}$. Find the number(s).

11. Solve for x: $7^{2x-7}49^{x+4} = 343$

12. Solve for x: $7^{2x-7} = 344$. Correct your answer to 4 decimal places.

13. Find the domain of $f(x)$ and give the answer using inequalities and on the real number line:

$$f(x) = \sqrt{-7(3x-5)+11x-9}$$

14. Find $3f(2) + f(f(5))$ if

a. f is defined as:

x	1	2	3	4	5
$f(x)$	-7	-1	9	5	3

b. $f(x) = x^2 - 7x$

15. Find the linear function $f(x)$ if $f(1) = -3$ and $f(5) = 9$.

Also, find $f(10)$.

16. Find (x, y) if the midpoint of (x, y) and $(1, -3)$ is $(2, 4)$.

Also, find the distance between the points $(1, -3)$ and $(2, 4)$.

17. Find the intercepts and vertex of $f(x) = -x^2 + 4x$. Also, find $f(3)$.
Sketch $f(x)$ and state its range.

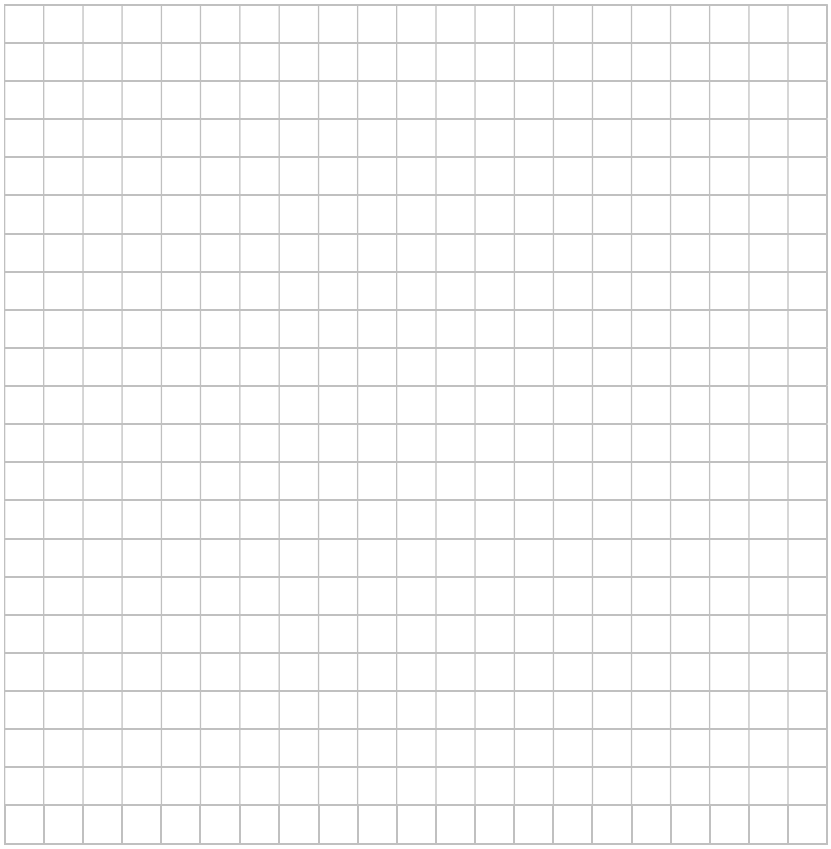
y-intercept:_____

x-intercept(s):_____

Vertex:_____

$f(3)$:_____

Range:_____



18. The height h in feet of a volleyball in a game, t seconds after it is released is given by

$$h(t) = 24 + 6t - 3t^2$$

a. When does the volleyball reach its maximum height and what is its maximum height?

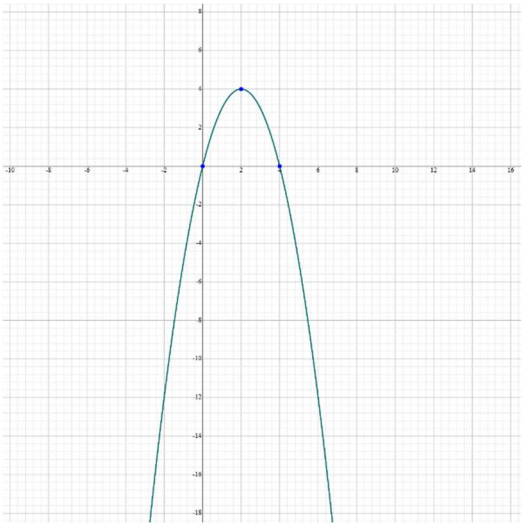
b. When will the volleyball hit the ground?

19. Find the exact value of $\tan 60° + csc\ 45° + 8\ cos\ 30°$

20. A ladder leaning against a wall makes an angle of 50° with the ground. If the ladder is 25 meters long, how far is the foot of the ladder from the wall? Correct your answer to 4 decimal places.

Answers:

1. $\frac{1}{128x^{14}y^5}$
2. $-40x^2 - 6x$
3. $\frac{2x+1}{x^2+3x+9}$
4. $\frac{x^2+10x-14}{5(x-7)(x+7)}$
5. $12\sqrt{3} + 12$
6. $x = -4$
7. $-37, -35, -33, -31$
8. $17,\ -11$
9. $5,\ -\frac{11}{2}$
10. $8,\ \frac{1}{4}$
11. $x = \frac{1}{2}$
12. $x = 5.001$
13. $x \leq \frac{13}{5}$
14. $a)\ 6 \qquad b) 140$
15. $y = 3x - 6, f(10) = 24$
16. $(3, 11), 5\sqrt{2}$
17. $y - int: (0,0), x - int: (0,0), (4,0), vertex: (2,4), range: y \leq 4,$ $f(3) = 3$



18. a) The maximum height is 27 feet after 1 second.
    b) 4 seconds
19. $\sqrt{2} + 5\sqrt{3}$
20. 16.0691 meters