

DAWSON COLLEGE
MATHEMATICS DEPARTMENT

FINAL EXAMINATION
Fall 2021

Remedial Activities for Secondary IV Mathematics
201-016-RE

Instructor: G. Chu

Student Name: _____

Student I.D.: _____

Date: December 17, 2021

Time: 9:30 – 12:30

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 $\frac{(2x^{-3}y)^{-5}}{2y^{-4}(2x)^{-4}}$ with positive exponents only.

2. Expand and simplify: $3(2x + 5)^2 - 3x(4x + 7)$.

3. Simplify $\frac{x^2+3x}{x^2-4} \div \frac{4x^2+17x+15}{x^3+8}$

4. Simplify $\frac{x+8}{x^2-49} - \frac{x}{x^2+5x-14}$

5. Rationalize the denominator and simplify the expression: $\frac{\sqrt{45}+1}{\sqrt{5}-2}$

6. If $Ax = B + C(x - D)$, solve for x.

7. The length of a rectangle is $(x + 2)cm$ and the width is $(x - 4)cm$. If the area is 3 cm^2 , find x .

8. The length of a rectangle is $x\text{ cm}$ and the width is $\frac{16}{x+3}\text{ cm}$. If the perimeter is 14 cm, find x .

9. If a man has \$415 in ten and five dollar bills, how many of each does he have if he has 50 bills in all?

10. Solve for x : $\sqrt{15 - x} - 15 = x$.

11. Solve for x: $25^{4x-9} = 125 \cdot 5^{x+8}$

12. Solve for x: $\log_{16} (3x - 7) = \frac{1}{2}$

13. Solve for x: $-7 < \frac{x}{2} - 6(x - 5) \leq 3$

14. Consider the line segment joining $(6, \sqrt{3})$ and $(7, 4\sqrt{3})$. Find and simplify:

a. the distance between these 2 points.

b. the slope of the above line segment.

15. Let $f(x) = \sqrt{21 - 3x}$ and $g(x) = x^2 + 2x + 7$.

a. Find the domain of $f(x)$.

b. Find $g(f(4)) + g(x + 1)$ and simplify.

16. Find an equation of the line if it passes through the midpoint of $(7, 2)$ and $(-3, 4)$ and is perpendicular to $5y + x + 9 = 0$.

17. Find the intercepts and vertex of $f(x) = 2x^2 - 12x$. Sketch and state its range.



y-intercept: _____

x-intercept(s): _____

Vertex: _____

Range: _____

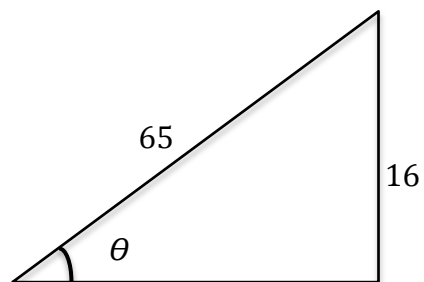
18. The height h in meters of a basketball in a game, t second(s) after it is thrown is given by

$$h(t) = 0.936 + 8.06t - 13t^2$$

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

- b. When will the basketball hit the ground?

19. a. Find the exact value of $\csc \theta + 2 \cot \theta$.



- b. Find the exact value of $\sec 45^\circ \sin 60^\circ$.

20. A ladder leaning against a wall makes an angle of 73° with the ground. If the ladder is 8 meters long, how far is the foot of the ladder from the wall? Correct your answer to 4 decimal places.

Answers:

1. $\frac{x^{19}}{4y}$
2. $39x + 75$
3. $\frac{x(x^2 - 2x + 4)}{(x-2)(4x+5)}$
4. $\frac{13x-16}{(x-7)(x+7)(x-2)}$
5. $17 + 7\sqrt{5}$
6. $\frac{B-CD}{A-C}$
7. $1 + 2\sqrt{3}$
8. 5
9. 33 \$10 bills and 17 \$5 bills
10. -10
11. $\frac{29}{7}$
12. $\frac{11}{3}$
13. $\frac{54}{11} \leq x < \frac{74}{11}$
14. $2\sqrt{7}, 3\sqrt{3}$
15. $x \leq 7, x^2 + 4x + 32$
16. $y = 5x - 7$
17. $y = 2x^2 - 12x$
 - a. $y - int: (0, 0)$
 - b. $x - int: (0, 0), (6, 0)$
 - c. $vertex: (3, -18)$
 - d. $range: y \geq -18$
18. 0.31s, 2.1853 meters, 0.72s
19. $\frac{191}{16}, \frac{\sqrt{6}}{2}$
20. 2.3390 meters

