DAWSON COLLEGE
MATHEMATICS DEPARTMENT

FINAL EXAMINATION
Winter 2024

Remedial Activities for Secondary IV Mathematics
201-016-RE

Instructor: G. Chu

Student Name:_____

Student I.D.:_____

Date: May 28, 2024 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 $\frac{8x^{-6}}{y^2(2x^3y)^{-6}}$ with positive exponents only.

2. Expand and simplify: $4x(x-5)^2-(4x^3+70x)$

3. Simplify $\frac{x^2-25}{x^2+4x} \div \frac{3x^2+4x+15x+20}{x^3+64}$

4. Simplify $\frac{\frac{1}{2}-\frac{1}{x}}{1+\frac{4}{x}-\frac{12}{x^2}}$

5. Rationalize the denominator and simplify the expression: $\frac{28}{\sqrt{18}-2}$

6. Solve for x: $x - 5 = A(x - 5) + Ax - 5$

7. For a field trip organized by Dawson Math Department, 7 students and 3 teachers pay $282, while 5 students and 2 teachers pay $197. What is the price for each?

8. The length of the hypotenuse of a right-angled triangle is $x + 8$. The lengths of two other sides are x and $x - 1$, find x.

9. Solve for y: $\frac{y}{y-3} + \frac{5}{y+3} = \frac{18}{y^2-9}$.

10. Solve for x: $x = \sqrt{5-x} - 7$

11. Solve for x: $5^{2x-3} = 125^{7x+4}$.

12. Solve for x: $5^{2x-3} = 12$. Correct your answer to 4 decimal places.

13. Solve for x and give the answer using inequalities and on the real number line:

$$-6 < -2(4(3x - 5) + 8x) \leq 4$$

14. Let $f(x) = \frac{2024}{2x^2-9x+7}$ and $g(x) = x^2 + 3x + 6$.

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

b. Find $g(x + 2) + g(2)$ and simplify.

15. Find the linear function $f(x)$ that passes through the points $(1, -3)$ and $(-1, 7)$.

Also, find the midpoint and the distance between the points $(1, -3)$ and $(-1, 7)$.

16. Find the quadratic function $f(x)$ that passes through the points $(0, 0)$, $(1, -3)$ and $(-1, 7)$.

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

y-intercept:_____

x-intercept(s):_____

Vertex:_____

Range:_____

18. The height h in meters of a hockey puck in a game, t second after it is released is given by

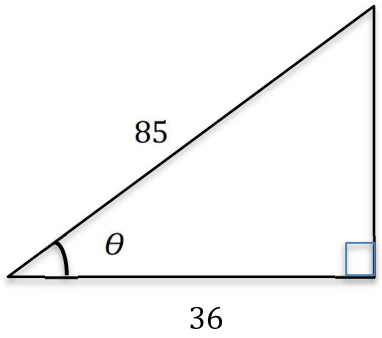
$$h(t) = 16t - 2t^2$$

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

b. When will the hockey puck hit the ground?

19. Find the exact value of $4sin^2 30° + sec\, 45° + tan\, 60°$

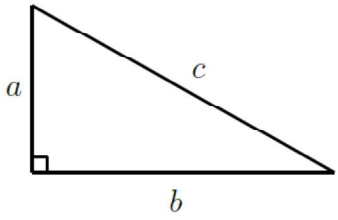
20. Find the exact value of $2\cot\theta + 5\csc\theta$.



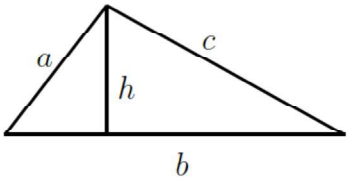
DAWSON COLLEGE

Mathematics 201-016-RE
Information Sheet

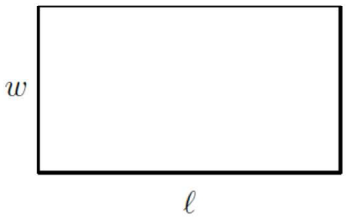
$$x^3 - y^3 = (x - y)(x^2 + xy + y^2)$$
$$x^3 + y^3 = (x + y)(x^2 - xy + y^2)$$



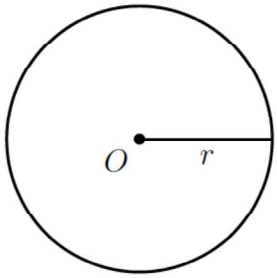
$$a^2 + b^2 = c^2$$



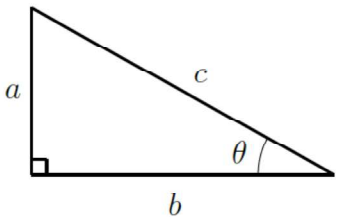
$$A = \frac{bh}{2}$$
$$P = a + b + c$$



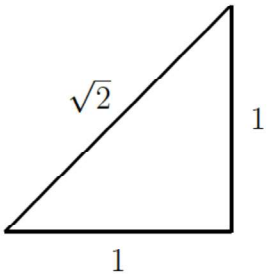
$$A - \ell w$$
$$P = 2\ell + 2w$$

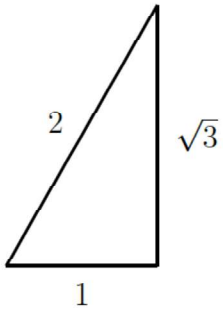


$$C = 2\pi r$$
$$A = \pi r^2$$



$$\sin\theta = \frac{a}{c} \qquad \cos\theta = \frac{b}{c} \qquad \tan\theta = \frac{a}{b}$$
$$\csc\theta = \frac{c}{a} \qquad \sec\theta = \frac{c}{b} \qquad \cot\theta = \frac{b}{a}$$





Answers:

1. $512x^{12}y^4$
2. $-40x^2 + 30x$
3. $\frac{(x-5)(x^2-4x+16)}{x(3x+4)}$
4. $\frac{x}{2(x+6)}$
5. $6\sqrt{2} + 4$
6. $\frac{5A}{2A-1}$
7. $27 for students and $31 for teachers
8. $x = 21$
9. $y = -11$
10. $x = -4$
11. $x = -\frac{15}{19}$
12. $x = 2.2720$
13. $\frac{9}{10} \leq x < \frac{23}{20}$

14. $x \neq 1, x \neq \frac{7}{2}, x^2 + 7x + 32$
15. $f(x) = -5x + 2, (0, 2), 2\sqrt{26}$
16. $f(x) = 2x^2 - 5x$
17. $y - int: (0, 4), x - int: none, vertex: (1, 3), range: y \geq 3$
18. 50 computers and $476
19. $1 + \sqrt{2} + \sqrt{3}$
20. $\frac{71}{11}$