



CANADIAN UNIVERSITY OF DUBAI

MATHEMATICS PLACEMENT TEST

ENGINEERING & ARCHITECTURE/INTERIOR DESIGN

Spring Semester 2010

INSTRUCTIONS (PLEASE READ CAREFULLY)

- The test consists of 30 questions. Each question is followed by four suggested answers designated by (A), (B), (C), (D). Mark the correct answer by circling it.
- Calculators are NOT allowed for this test.
- The grading is as follows:
 - 5 points for each correct answer;
 - 0 points for each unanswered question;
 - -1 point for each incorrect answer.
- Make sure to write your name and ID number

Name:	ID Number:	
Total:	Pass	Fail

Computing And Algebra

1. The value of $(3.14 \times 2^2 - 2.56) \times 21 \div 2$ is:

- (A) -14.32
- (B) 387.2232
- (C) 105
- (D) -20.6

2. The value of $\frac{-(-8 + 5) - (\frac{1}{3})(\frac{25}{4})}{7 + \frac{1}{3}}$ is:

- (A) $13/28$
- (B) $1/8$
- (C) $61/88$
- (D) $25/11$

3. A factorization of $8y^3 - z^6$ is:

- (A) $(2y + z^2)(4y^2 - 2yz^2 + z^4)$
- (B) $(4y - z^3)(2y + z^3)$
- (C) $(8y + z^2)(y^2 - yz^2 - z^4)$
- (D) $(2y - z^2)(4y^2 + 2yz^2 + z^4)$

4. The result of simplifying $\sqrt[3]{\frac{3z^2}{24y}} \sqrt[3]{\frac{9y^4}{z^8}}$ is

- (A) $\frac{3y^{3/2}}{2z^3}$
- (B) $\frac{3y}{2z^4}$
- (C) $\frac{3}{2^{2/3}} \frac{y^3}{z^2}$
- (D) $\frac{3^{2/3}}{2} \frac{y}{z^2}$

5. $\frac{3}{4-\sqrt{7}}$ is equal to

- (A) $\frac{1}{3}(4 - \sqrt{7})$
- (B) $\frac{1}{3}(4 + \sqrt{7})$
- (C) $3(4 + \sqrt{7})$
- (D) $(4 - \sqrt{7})$

6. The solution set of the inequality $x^2 + 4x \leq 5$ is

- (A) $-1 \leq x \leq 1$
- (B) $-5 \leq x \leq 5$
- (C) $-1 \leq x \leq 5$
- (D) $-5 \leq x \leq 1$

7. The solution of the equation $\frac{3x}{x-2} + \frac{1}{2} = \frac{3}{x-1}$

- (A) $x = 1, 2$
- (B) $x = 0, -1$
- (C) $x = 0, 2$
- (D) No solution

8. $(x - 2)(x^2 + 2x + 2)$ is equal to

- (A) $x^3 - 2x - 4$
- (B) $x^3 - 4x - 4$
- (C) $x^3 - 2x^2 - 4$
- (D) $x^3 - 4$

9. The solutions of the equation $\sqrt{3x + 1} - \sqrt{2x - 1} = 1$ are

- (A) $x = 5$ only
- (B) $x = 1, 5$
- (C) $x = 1$ only
- (D) $x = -1, -5$

10. The solutions of the system of equations $\begin{cases} xy = 6 \\ x - 2y = 4 \end{cases}$ are

- (A) $(-3, -2), (6, 1)$
- (B) $(-2, -3), (6, 1)$
- (C) $(2, 3), (6, 1)$
- (D) $(-2, -3), (-6, -1)$

11. The value of the sum $1 + 3 + 5 + 7 + \dots + 59$ is equal to

- (A) 600
- (B) 750
- (C) 400
- (D) 900

12. The expansion of $(x + 3y)^4$ is

- (A) $x^4 + 12x^3y + 54x^2y^2 + 108xy^3 + 81y^4$
- (B) $x^4 + 81y^4$
- (C) $x^4 + 36x^2y^2 + 81y^4$
- (D) $x^4 + 3y^4$

13. If $|2u - 1| = 2$, then:

- (A) $u = 3/2$ only
- (B) $u = 1/2$ only
- (C) $u = -3/2$ and $u = 1/2$
- (D) $u = 3/2$ or $u = -1/2$

Precalculus

14. If $|2x - 1| \leq 1$ then

- (A) $\frac{1}{2} \leq x \leq 2$
- (B) $0 \leq x \leq 2$
- (C) $0 \leq x \leq 1$
- (D) $x \leq 0$

15. The value of a for which the line $ax + y = 1$ is perpendicular to $3x - 4y = 0$ is

- (A) $a = -\frac{3}{4}$
- (B) $a = \frac{4}{3}$
- (C) $a = -\frac{4}{3}$
- (D) $a = \frac{3}{4}$

16. If $5^{3x} = \frac{1}{25}$ then

- (A) $x = \frac{1}{6}$
- (B) $x = -\frac{1}{6}$
- (C) $x = -\frac{2}{3}$
- (D) $x = -3$

17. The graph of the curve $y = x^3 - 9x$ meets the x-axis at the points

- (A) $(0, 0)$ only
- (B) $(0, 0), (3, 0), (-3, 0)$
- (C) $(0, 0), (0, 3), (0, -3)$
- (D) $(0, 0), (3, 0)$ only

18. If $f(x) = x^2 - 3$, $g(x) = \sqrt{2x - 1}$, then $f(g(3))$ is equal to

- (A) 2
- (B) 3
- (C) 6
- (D) $\sqrt{5}$

19. The graph of the equation $y = 2x^2 - x - 1$ is:

- (A) a downward parabola with vertex at $x_0 = -1/4$ and x-intercepts at $x = 1/2$ and -1
- (B) an upward parabola with vertex at $x_0 = 1/4$ and x-intercepts at $x = -1/2$ and 1
- (C) an upward parabola with vertex at $x_0 = -1/4$ and x-intercepts at $x = -1/4$ and 1
- (D) an upward parabola with y-intercept at $y = -1$ and x-intercepts at $x = 1/2$ and 1

20. The vertical asymptotes of the function $f(x) = \frac{(x-1)(x+2)}{(x-2)(x^3+27)}$ are the lines:

- (A) $x = 2$ and $x = -2$
- (B) $y = 2$ and $y = -3$
- (C) $x = 2$ and $x = -3$
- (D) $x = 1$ and $x = -2$

Geometry and Trigonometry

21. If $\cos \theta < 0$, then the angle θ on the unit circle is in:

- (A) quadrant 2 only
- (B) quadrant 1 or quadrant 4
- (C) quadrant 2 or quadrant 3
- (D) quadrant 3 only

22. If $\sin \theta = 1/3$, then $\cos \theta$ is:

- (A) $\pm \frac{2\sqrt{2}}{3}$
- (B) $\frac{4}{3}$ only
- (C) $\frac{2\sqrt{2}}{3}$ only
- (D) $\frac{2}{3}$ only

23. Let a and b be the legs in a right angle triangle and let c be the hypotenuse. If θ is the angle $(\widehat{a,c})$, that is the angle with sides a and c , then

- (A) $\sin \theta = \frac{a}{c}$, $\cos \theta = \frac{b}{c}$ and $\tan \theta = \frac{a}{b}$
- (B) $\sin \theta = \frac{b}{c}$, $\cos \theta = \frac{a}{c}$ and $\tan \theta = \frac{a}{b}$
- (C) $\sin \theta = \frac{b}{c}$, $\cos \theta = \frac{a}{c}$ and $\tan \theta = \frac{b}{a}$
- (D) $\sin \theta = \frac{a}{b}$, $\cos \theta = \frac{b}{c}$ and $\tan \theta = \frac{a}{b}$

24. The centre and radius of the circle $x^2 + x + y^2 = 0$ are

- (A) $(\frac{1}{2}, 0)$ and $\frac{1}{2}$
- (B) $(1, 0)$ and 1
- (C) $(\frac{1}{2}, 0)$ and $-\frac{1}{2}$
- (D) $(-\frac{1}{2}, 0)$ and $\frac{1}{2}$

25. The lateral surface area of a can is 80π . The radius of its lid is two fifth of its height. Then

- (A) radius = 10 and height = 4
- (B) radius = 2 and height = 5
- (C) radius = 5 and height = 2
- (D) radius = 4 and height = 10

Problem Solving

26. Seven years ago, my son was one-third of my age at that time. Seven years from now he will be one-half my age at that time. How old is my son.?

(A) 20
(B) 18
(C) 21
(D) 30

27. A cab company charges a fixed fee of \$3.00 plus \$0.50 per kilometer. the cost of traveling 10 kilometers is:

(A) \$8.00
(B) \$35.00
(C) \$30.50
(D) \$10.00

28. A folding machine folds letters at a rate of 45 per minute and a stamping machine stamps folded letters at a rate of 60 per minute. What is the fewest number of each machine required so that all the machines are kept busy?

(A) Folding = 2, Stamping = 1
(B) Folding = 4, Stamping = 3
(C) Folding = 3, Stamping = 4
(D) Folding = 2, Stamping = 2

29. You have three consecutive integers less than 20. Add two of them together, divide by the third of the third number, and the answer is the smallest of the three integers. What are the numbers?

(A) 12, 13, 14
(B) 6, 7, 8
(C) 7, 8, 9
(D) 9, 10, 11

30. Given a sphere with radius 10, the lateral surface area of the smallest cylinder containing the sphere is

(A) 628.32
(B) 400.00
(C) 200.00
(D) 1256.64