

MATH PLACEMENT EXAM

بوليتكنك
POLYTECHNIC

“Building the Future of UAE Technologies”

What is the Math Placement Exam

After the acceptance of the student to Abu Dhabi Polytechnic (ADPoly), he/she has to take the math placement exam, before the registration of the courses.

The Academic support department at ADPoly uses the result of the exam, to check the math skill level of the new students. Hence, the student can be placed at the right level.

Timing of the Exam

**Date: Monday and Tuesday
21st and 22rd of August 2017**
**Time: 10 AM – 12 PM
13:00 PM – 15 PM**
**Place: Abu Dhabi Campus: Mohammad Bin Zayed City,
Abu Dhabi Polytechnic, 2nd Floor
Al Ain Campus: Abu Dhabi Polytechnic, Al Ain,
Airport Area**

• General Characteristics of the Exam

- The exam consists entirely of 50 multiple choice questions, each with four choices. The time allowed is 2 hours to complete the exam.
- The questions are ordered from elementary to more advanced questions in 3 main topics: Algebra, geometry and trigonometry and statistics
- The objective of the exam is to measure the student understanding of the following topics:

**The exam is done on the
computer and it has been built
using a multiple-choice format**

- **The Covered Topics in the Exam**

- Algebraic operation on numbers
- Approximate numbers and scientific notations
- Algebraic operations on expressions and equations
- Concept of a function and various functions properties and their graphs
- Solving linear and quadratic equations using various methods
- Solving logarithmic and exponential equations.
- Measurements of angles, lines, triangles, circles and solid figures
- Concept of trigonometric functions and properties of right triangle
- Signs of the trigonometric functions of any angle
- Radian measure and applications
- Vectors and applying the law of sines and cosine on oblique triangles
- Concept of a matrix and Cramer's rule
- Graphs of trigonometric functions
- Elementary statistical concepts and measures

You will save at least one semester of taking math by taking the time to do a careful review of the placement math exam.

- **How to Prepare For The Exam**

- Use the following tutorial web pages, which will help you make a review of all the above topics:

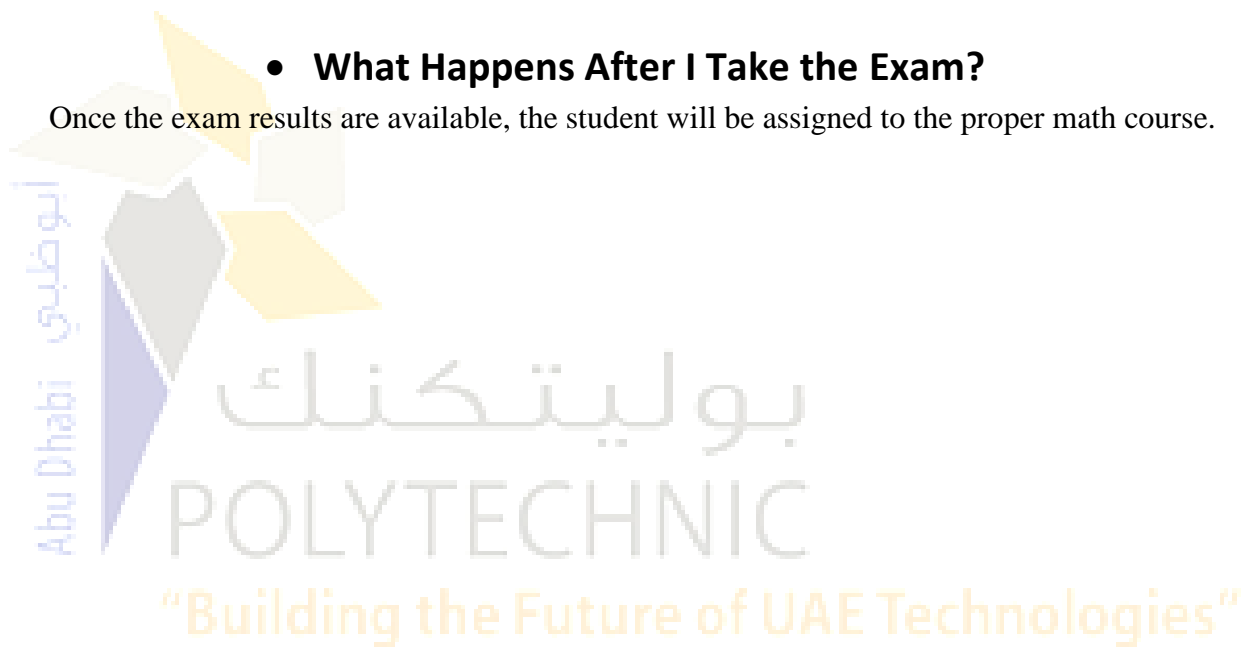
[Khan Academy](#)

[Patrickjmt](#)

- You can also see the following reference books:
 1. Washington, A. (2009) *Basic Technical Mathematics with Calculus*, Prentice Hall, 9th Edition.
 2. Wallace, T. (2010) *Beginning and Intermediate Algebra*,
<http://wallace.ccfaculty.org/book/book.html>
 3. Sullivan, M. (2015) *Precalculus 10th*, Prentice Hall, 10th Edition.
- Check the hardcopy of the sample exam, which is attached to this document This will give you an idea about the level of the Exam.

- **What Happens After I Take the Exam?**

Once the exam results are available, the student will be assigned to the proper math course.



Sample placement Math Test

1) Find the absolute value of $|-12|$ 1) _____
A) 12 B) ± 12 C) -12 D) 0

2) Find the reciprocal of the number $\frac{3}{8}$ 2) _____
A) 1 B) $-\frac{8}{3}$ C) $-\frac{3}{8}$ D) $\frac{8}{3}$

3) Perform the indicated operation $\frac{-490}{98}$ 3) _____
A) -15 B) -5 C) 5 D) $-\frac{1}{5}$

4) Find the product of $(-6)(-3)(-3)$ 4) _____
A) -44 B) 54 C) 36 D) -54

5) Find the value of $2 + (-15)(-20) + (-14)$ 5) _____
A) 23 B) 102 C) 326 D) 288

6) Determine which of the fundamental laws of algebra is demonstrated in the following expression: $(6 \times 8) \times 4 = 6 \times (8 \times 4)$ 6) _____
A) Distributive B) Commutative C) Associative

7) Determine the number of significant digits in 0.0703 7) _____
A) 4 B) 1 C) 3 D) 2

8) Simplify $(-4x^6y)^3$ 8) _____
A) $-64x^{18}y^3$ B) $-12x^6y^3$ C) $-64x^9y^3$ D) $-12x^6y$

9) Simplify $\frac{8n^4}{-2n}$ 9) _____
A) -4 B) $-4n^4$ C) $-4n^3$ D) $-4n$

10) Simplify the following expression $(-7y)(-4y^5)$ 10) _____
 A) $-11y^5$ B) $7y - 4y^5$ C) $28y^6$ D) $-28y^6$

11) Simplify $\sqrt{9^2 + 2^2}$ 11) _____
 A) Not real number B) $\sqrt{85}$
 C) 11 D) $\sqrt{77}$

Express the number in standard notation.

12) Express the number in standard notation 2.42×10^{-4} 12) _____
 A) -242,000 B) 0.0000242 C) 0.00242 D) 0.000242

13) Express the number in scientific notation 0.000582 13) _____
 A) 5.82×10^{-5} B) 5.82×10^4 C) 5.82×10^{-3} D) 5.82×10^{-4}

Determine the principal value without using a calculator.

14) Determine the value of $-\sqrt{\frac{25}{49}}$ 14) _____
 A) $\frac{5}{7}$ B) $-\frac{5}{7}$
 C) $-\frac{12}{24}$ D) Not a real number

15) Simplify $[6y + (8y + 2)] - [(-8y + (-4 + 6y)) + 6y]$ 15) _____
 A) $18y - 2$ B) $10y + 6$ C) $6y - 2$ D) $6y - 6$

16) Simplify $2(3x - 4)^2$ 16) _____
 A) $18x^2 - 24x + 16$ B) $18x^2 - 48x + 32$ C) $18x^2 + 32$ D) $36x^2 - 96x + 64$

17) Determine the value of $(-3 + x)(5x - 10)$ 17) _____
 A) $5x^2 + 30x - 25$ B) $x^2 - 25x - 25$ C) $5x^2 - 25x + 30$ D) $5x^2 - 26x + 30$

18) Solve the equation $12(x - 48) = 24$ 18) _____
 A) 46 B) 24 C) 50 D) 48

19) Solve for n: $\frac{120}{20} = \frac{24}{n}$ 19) _____
 A) 6 B) 5 C) 4 D) 24

20) Solve the equation for n : $\frac{1}{3}n - (6 - a) = 2a$ 20) _____

- A) $9a - 18$ B) $0.33333333a + 2$ C) $3a + 18$ D) $9a + 18$

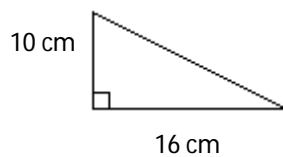
21) Solve the equation for n : $A = P(1 + nr)$ 21) _____

- A) $n = \frac{P - A}{Pr}$ B) $n = \frac{A}{r}$ C) $n = \frac{Pr}{A - P}$ D) $n = \frac{A - P}{Pr}$

22) A tree 11 feet high grows at the rate of 3 feet each year. How many years will it take for the tree to grow to a height of 38 feet? 22) _____

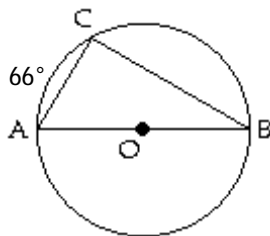
- A) 14 years B) 9 years C) 24 years D) 23 year(s)

23) Find the missing length in the right triangle (i.e. Find the hypotenuse) 23) _____



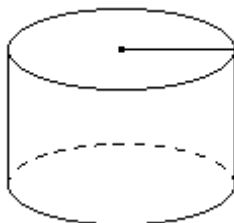
- A) 13 cm B) 180 cm C) 360 cm D) 19 cm

24) Find the angle indicated by the arc \widehat{BC} . 24) _____



- A) 66° B) 123°
C) Not enough information. D) 114°

25) Find the volume of the following cylinder 25) _____



Radius = 4.5 cm, height = 18 cm

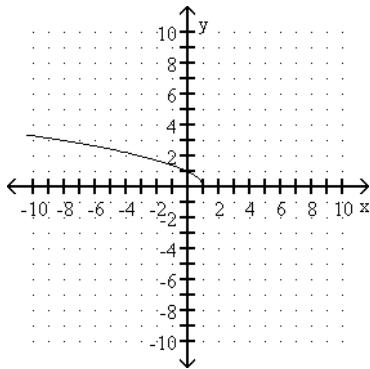
- A) 510 cm^3 B) 4600 cm^3 C) 250 cm^3 D) 1100 cm^3

26) Find $f(-3)$ when $f(x) = x^2 - 5x + 7$. 26) _____
 A) 17 B) -13 C) 1 D) 31

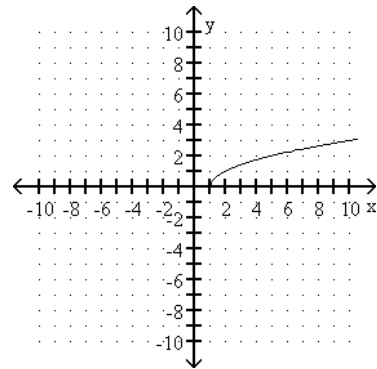
27) Find the domain and range of $f(x) = \sqrt{6+x}$ 27) _____
 A) Domain: $x \geq -6$; range: $y \geq 0$
 B) Domain: $x \geq 0$; range: All real numbers
 C) Domain: All real numbers; range: All real numbers
 D) Domain: All real numbers; range: $y \geq -6$

28) Graph the function $y = \sqrt{x-1}$ 28) _____

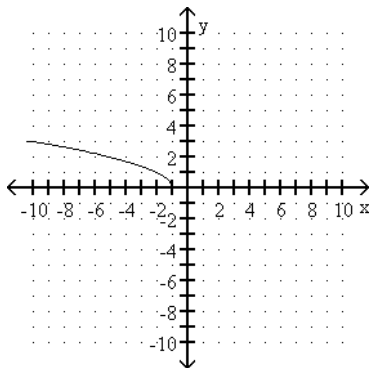
A)



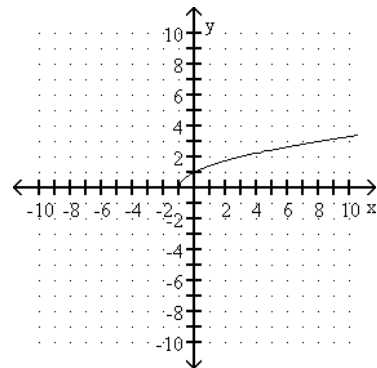
B)



C)



D)



29) If $\sin \theta = \frac{3}{8}$, find $\cos \theta$. 29) _____
 A) $\frac{3}{55}$ B) $\frac{8}{55}$ C) $\frac{\sqrt{55}}{3}$ D) $\frac{\sqrt{55}}{8}$

30) Find the slope and the y-intercept of the equation $2x + 7y = 34$ 30) _____

A) Slope $-3\frac{1}{2}$; y-intercept $(0, \frac{7}{34})$

B) Slope $-\frac{2}{7}$; y-intercept $(0, \frac{34}{7})$

C) Slope $\frac{2}{7}$; y-intercept $(0, \frac{34}{7})$

D) Slope $3\frac{1}{2}$; y-intercept $(0, \frac{7}{34})$

31) Solve the following system of equations: 31) _____

$$x + y = -1$$

$$x - y = 13$$

A) $x = -6, y = -6$

B) $x = 6, y = -7$

C) $x = 5, y = -6$

D) Inconsistent

32) Evaluate the determinant: 32) _____

$$\begin{vmatrix} 2 & 1 & 5 \\ 3 & 2 & 4 \\ 4 & 1 & 1 \end{vmatrix}$$

A) 16

B) -16

C) 86

D) -48

33) Perform the following operation and simplify 33) _____

$$\frac{3}{5x} + \frac{9}{10x}$$

A) $\frac{3}{2x}$

B) $\frac{15}{20x}$

C) 1

D) $\frac{2}{3x}$

34) Perform the following operation and simplify 34) _____

$$\frac{6}{x-6} - \frac{3}{6-x}$$

A) -1

B) $\frac{9}{x-6}$

C) $\frac{11}{x-6}$

D) $\frac{3}{x+6}$

35) Solve for the following equation for c : $\frac{1}{a} + \frac{1}{b} = \frac{1}{c}$ 35) _____

A) $\frac{ab}{a+b}$

B) $a+b$

C) $\frac{a+b}{ab}$

D) $ab(a+b)$

36) Solve for k: $-8k^2 - 20 = -308$ 36) _____

A) -154

B) ± 12

C) ± 6

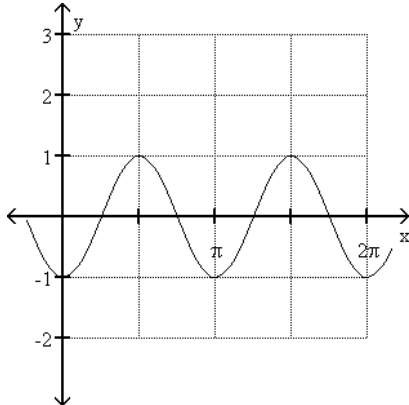
D) 6

- 37) Solve for n : $3n^2 = -12n - 2$ 37) _____
 A) $\frac{-12 \pm \sqrt{30}}{3}$ B) $\frac{-6 \pm \sqrt{30}}{3}$ C) $\frac{-6 \pm \sqrt{42}}{3}$ D) $\frac{-6 \pm \sqrt{30}}{6}$
- 38) Given that $\tan \theta = 1.2$, determine the quadrants in which the terminal side of the angle can lie. 38) _____
 A) III, IV B) II, III C) I, III D) I, IV
- 39) Determine the quadrant containing the terminal side of θ where $\sec \theta < 0$ and $\tan \theta < 0$ 39) _____
 A) Quadrant II B) Quadrant IV C) Quadrant III D) Quadrant I
- 40) Express the trigonometric function of $\sin 150^\circ$ in terms of the same function of a positive acute angle 40) _____
 A) $\sin 30^\circ$ B) $\sin 75^\circ$ C) $-\sin 75^\circ$ D) $-\sin 30^\circ$
- 41) Find the missing parts of the triangle, where 41) _____
 $A = 30.0^\circ$
 $a = 16.57$
 $b = 33.14$
 A) $B = 60.0^\circ, C = 90.0^\circ, c = 28.7$ B) No solution
 C) $B = 60.0^\circ, C = 60.0^\circ, c = 28.7$ D) $B = 90.0^\circ, C = 60.0^\circ, c = 28.7$
- 42) Find the missing parts of the triangle, where 42) _____
 $C = 107.0^\circ$
 $a = 8.50$
 $b = 11.95$
 A) $c = 19.5, A = 31.3^\circ, B = 41.7^\circ$ B) $c = 22.4, A = 27.3^\circ, B = 45.7^\circ$
 C) No triangle satisfies the given conditions. D) $c = 16.6, A = 29.3^\circ, B = 43.7^\circ$
- 43) Find the period of $y = 5 \cos (5x + \frac{\pi}{2})$. 43) _____
 A) $\frac{2\pi}{5}$ B) $\frac{\pi}{2}$ C) π D) 5

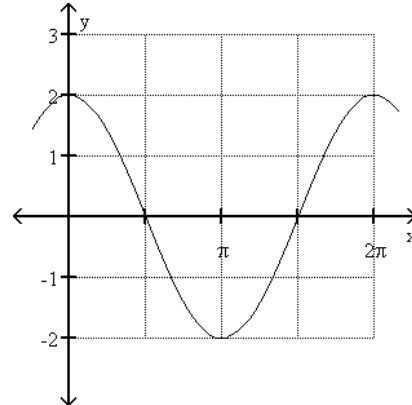
44) Sketch the graph of the function over the interval $0 \leq x \leq 2\pi$, where $y = 2 \sin(x + \frac{\pi}{2})$

44) _____

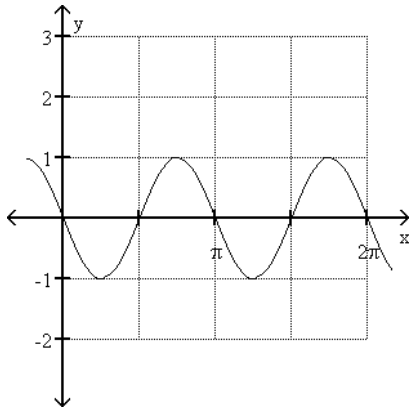
A)



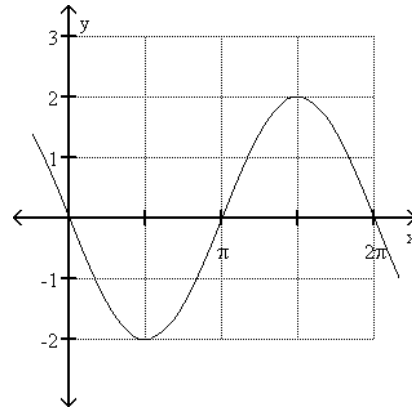
B)



C)



D)



45) Evaluate the given expression: $16^{-1/4}$

45) _____

A) $\frac{1}{4}$

B) -2

C) 2

D) $\frac{1}{2}$

46) Solve the equation for y in terms of x: $\ln y + 10 \ln x = 1 + \ln 3$

46) _____

A) $y = \frac{3+1}{x^{10}}$

B) $y = \frac{3e}{x^{10}}$

C) $y = 4 - 10x$

D) $y = e + 3 - 10x$

47) Find the median of : 5, 1, 26, 14, 48, 44, 36

47) _____

A) 25

B) 14

C) 36

D) 26

Answer Key

Testname: SAMPLE TEST NEW

- 1) A
- 2) D
- 3) B
- 4) D
- 5) D
- 6) C
- 7) C
- 8) A
- 9) C
- 10) C
- 11) B
- 12) D
- 13) D
- 14) B
- 15) B
- 16) B
- 17) C
- 18) C
- 19) C
- 20) C
- 21) D
- 22) B
- 23) D
- 24) D
- 25) D
- 26) D
- 27) A
- 28) B
- 29) D
- 30) B
- 31) B
- 32) B
- 33) A
- 34) B
- 35) A
- 36) C
- 37) B
- 38) C
- 39) A
- 40) A
- 41) D
- 42) D
- 43) A
- 44) B
- 45) D
- 46) B
- 47) D
- 48) D
- 49) D
- 50) C