



Sample Test Math

بوليتكنك
POLYTECHNIC

“Building the Future of UAE Technologies”

Sample Questions for math part of the placement exam

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Evaluate the expression.

1) $-4 \cdot 5^2$ 1) _____
A) -100
B) 400
C) -400
D) 100

2) $64 - 6 \cdot 10 + 170 \div (-17)$ 2) _____
A) -14
B) 570
C) -614
D) -6

Evaluate the expression for $x = -2$, $y = 3$, and $a = -4$.

3) $5x - 6y - 3a$ 3) _____
A) 5
B) -16
C) -32
D) 39

4) $\frac{y + 3x}{y - 5a}$ 4) _____
A) $-\frac{1}{9}$
B) $-\frac{5}{23}$
C) $-\frac{2}{23}$
D) $-\frac{3}{23}$

Determine what signs on values of x and y would make the statement true. Assume that x and y are not 0.

5) $xy < 0$ 5) _____
A) x and y must be positive.
B) x and y must be negative.
C) x and y have different signs.
D) x and y have the same sign.

Solve the problem.

6) The formula $C = \frac{5}{9}(F - 32)$ expresses the relationship between Fahrenheit temperature, F , and

6) _____

Celsius temperature, C . Use the formula to convert 68°F to its equivalent temperature on the Celsius scale.

- A) 56°C
- B) 4°C
- C) 65°C
- D) 20°C

Simplify the expression. Assume all variables represent nonzero real numbers.

7) $(8a^5) \cdot (2a^8)$

7) _____

- A) $16a^{40}$
- B) 10^{13}
- C) $16a^{13}$
- D) 10^{40}

8) $-\left(\frac{2x^3}{y^2}\right)^0$

8) _____

- A) $\frac{y^2}{8x^9}$
- B) -1
- C) 1
- D) $\frac{8x^9}{y^6}$

Find the sum or difference.

9) $(3a^4 - 8a^3) + (6a^4 + 5a^3)$

9) _____

- A) $9a^8 - 3a^6$
- B) $6a^7$
- C) $6a^{14}$
- D) $9a^4 - 3a^3$

Find the product.

10) $-2x^5(3x - 6)$

10) _____

- A) $-6x^5 + 12$
- B) $6x^6$
- C) $-6x^6 + 12x^5$
- D) $6x^6 - 12x^5$

11) $(3m - 8w)(3m + 8w)$

A) $9m^2 + 48mw - 64w^2$

B) $9m^2 - 48mw - 64w^2$

C) $9m^2 - 64w^2$

D) $3m^2 - 8w^2$

11) _____

Divide.

12) $\frac{18x^7 - 30x^4}{-6x^7}$

A) $-3 + \frac{5}{x^3}$

B) $-3 - 30x^4$

C) $18x^7 + \frac{5}{x^3}$

D) $-3 + 5x^3$

12) _____

Factor out the greatest common factor. Simplify the factors, if possible.

13) $15wx - 20wy - 25wz$

A) $5w(3x - 20wy - 25wz)$

B) $15w(x - 20y - 25z)$

C) $5w(3x - 4y - 5z)$

D) $5(3wx - 4wy - 5wz)$

13) _____

Factor by grouping.

14) $15x^2 - 12x + 10x - 8$

A) $(15x - 2)(x + 4)$

B) $(3x - 2)(5x + 4)$

C) $(3x + 2)(5x - 4)$

D) $(15x + 2)(x - 4)$

14) _____

Find the product or quotient.

15) $\frac{3x^2}{4} \div \frac{x^3}{24}$

A) $\frac{72x^2}{4x^3}$

B) $\frac{18x^2}{x^3}$

C) $\frac{x}{18}$

D) $\frac{18}{x}$

15) _____

Perform the indicated operations.

16) $\frac{1}{6x} - \frac{7}{12x}$ 16) _____

A) 1

B) $\frac{12}{-5x}$

C) $\frac{-5}{24x}$

D) $\frac{-5}{12x}$

17) $\frac{3}{4x} + \frac{7}{8x}$ 17) _____

A) 1

B) $\frac{13}{8x}$

C) $\frac{8}{13x}$

D) $\frac{13}{16x}$

Write the expression with only positive exponents and evaluate if possible. Assume all variables represent nonzero real numbers.

18) $\frac{\frac{x}{9}}{\frac{2}{x+6}}$ 18) _____

A) $\frac{2x}{9(x+6)}$

B) $\frac{x(x+6)}{18}$

C) $\frac{x+6}{18x}$

D) $18x(x+6)$

Solve the problem. Round to two decimal places unless otherwise indicated.

19) In the following formula, y is the minimum number of hours of studying required to attain a test 19) _____

score of x : $y = \frac{0.37x}{100.5 - x}$. How many hours of study are needed to score 82?

A) 1.64 hr

B) 101.04 hr

C) 16.40 hr

D) 4.22 hr

Write the expression with only positive exponents and evaluate if possible. Assume all variables represent nonzero real numbers.

20) -3^{-4}

20) _____

A) $\frac{1}{81}$

B) $-\frac{1}{81}$

C) -81

D) 81

Solve the formula for the indicated variable.

21) $S = 2\pi rh + 2\pi r^2$, for h

21) _____

A) $h = \frac{S}{2\pi r} - 1$

B) $h = S - r$

C) $h = 2\pi(S - r)$

D) $h = \frac{S - 2\pi r^2}{2\pi r}$

Perform the indicated operations. Write the result using only positive exponents. Assume all variables represent nonzero real numbers.

22) $\frac{(x-3)^0}{6x^{-6}}$

22) _____

A) $6x^6$

B) $\frac{x^6}{6}$

C) $\frac{x^9}{6}$

D) 0

Solve the formula for the indicated variable.

23) $R = nE - nr$, for n

23) _____

A) $n = \frac{R}{E - r}$

B) $n = R + nr - E$

C) $n = R - E + r$

D) $n = \frac{R + nr}{E}$

Solve the equation using the quadratic formula.

24) $3x^2 = -8x - 1$

24) _____

- A) $\left\{ \frac{-8 \pm \sqrt{13}}{3} \right\}$
- B) $\left\{ \frac{-4 \pm \sqrt{19}}{3} \right\}$
- C) $\left\{ \frac{-4 \pm \sqrt{13}}{3} \right\}$
- D) $\left\{ \frac{-4 \pm \sqrt{13}}{6} \right\}$

Solve the system by substitution.

25) $x - 4y = -13$

$-5x - 4y = -7$

25) _____

- A) \emptyset
- B) $\{(0, 2)\}$
- C) $\{(-3, -1)\}$
- D) $\{(-1, 3)\}$

Express the trigonometric function in terms of the same function of a positive acute angle.

26) $\sin 249^\circ$

26) _____

- A) $\sin 24^\circ$
- B) $\sin 69^\circ$
- C) $-\sin 69^\circ$
- D) $-\sin 24^\circ$

Find the area of the circle.

27) A circle with radius 7.18 mi

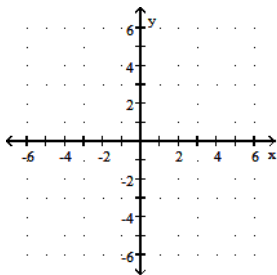
27) _____

- A) 90.2 mi^2
- B) 162 mi^2
- C) 45.1 mi^2
- D) 648 mi^2

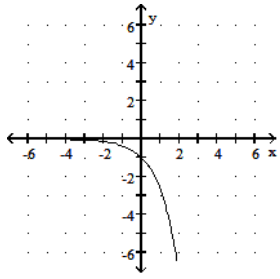
Graph the exponential function.

28) $y = e^x$

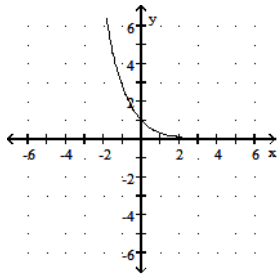
28) _____



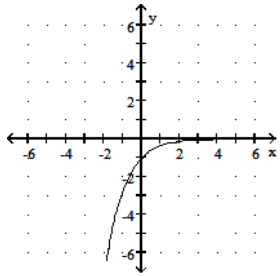
A)



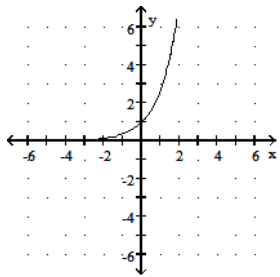
B)



C)



D)



Solve.

29) $\log_3 x = 2$

- A) 6
- B) 9
- C) 8
- D) 2

29) _____

Solve the equation for y in terms of x .

30) $\ln y - 2 \ln x = 1.6094$

- A) $y = 1.6094x^2$
- B) $y = 5 + 2x$
- C) $y = 5x^2$
- D) $y = 1.6094 + 2x$

30) _____

Answer Key

Testname: MATH_SAMPLE

- 1) A
- 2) D
- 3) B
- 4) D
- 5) C
- 6) D
- 7) C
- 8) B
- 9) D
- 10) C
- 11) C
- 12) A
- 13) C
- 14) C
- 15) D
- 16) D
- 17) B
- 18) B
- 19) A
- 20) B
- 21) D
- 22) B
- 23) A
- 24) C
- 25) D
- 26) C
- 27) B
- 28) D
- 29) B
- 30) C