Study Guide for the Math Placement Exam

The following are a sample of questions on the Math Placement Exam. We strongly recommend you to complete this study guide without the use of a calculator.

Introduction to Algebra

1. Evaluate algebraic expressions

1) What is the value of $-3p + 4q^2$ when $p = -4$ and $q = -2$?

(a) -28 (b) -12 (c) 4

(d) -36 (e) 28

2) If $x = 4$ and $y = -3$, find the value of $x^2 - 5xy$.

(a) -44 (b) -51 (c) -54

(d) 69 (e) 76

2. Solve linear equations, literal equations and inequalities

3) Find x if $4x + 3 = 5x - 1$

(a) 1 (b) 2 (c) 3

(d) 4 (e) 5

4) Solve the following equation for x: $\frac{2x-1}{3} = \frac{4x-3}{2}$

(a) $-\frac{1}{4}$ (b) $-\frac{7}{8}$ (c) $\frac{7}{8}$

(d) 4 (e) none of these

5) Find x if $4-\frac{3}{5}x=13$

(a) 15 (b) $-\frac{27}{5}$ (c) -15

(d) $-\frac{61}{3}$ (e) none of these

6) Solve the equation $a+b(x-y)=c$ for x in terms of a, b, c and y.

(a) $by+a-c-b$ (b) $\frac{by-a-c}{b}$ (c) $y-a-c$

(d) $\frac{by+a-c}{b}$ (e) none of these

7) Solve the inequality for y: $5y-7+2y>8y-3$

(a) $y>4$ (b) $y<-4$ (c) $y>\frac{4}{5}$

(d) $y<\frac{4}{5}$ (e) $y>\frac{2}{3}$

3. Laws of Exponents

8) The product of $3p^3q^2$ and $4q$ is

(a) $7p^3q^3$ (b) $7p^3q^2$ (c) $12p^3q^3$

(d) $3p^3q^3$ (e) $12p^3q^2$

9) Simplify: $2a(-4a^2b^3)^3$

(a) $-12a^5b^6$ (b) $-64a^6b^9$ (c) $-192a^5b^6$

(d) $-128a^7b^9$ (e) $24a^7b^9$

10) Simplify: $\frac{(8^3 x^{-3} y^4)^{-4}}{(8^5 xy^5)^{-5}}$, for $x \neq 0$ and $y \neq 0$.

(a) $\frac{x^4}{8^2 y}$ b) $\frac{8^{13} y^{41}}{x^{17}}$ (c) $\frac{8^{13} y^{19}}{x^{17}}$

(d) $8^{13} x^{17} y^9$ (e) none of these

4. Add, subtract, multiply and divide polynomials

11) $5x+7(x-5)-3(y-5)=$?

(a) $7x-3y$ (b) $7x-3y-20$ (c) $12x-3y-10$

(d) $12x-3y-50$ (e) $12x-3y-20$

12) Add $5x^2-2x$ and $7x+8$

(a) $12x^2+6$ (b) $12x^3+6$ (c) $12x^2+2$

(d) $5x^2+5x+8$ (e) none of these

13) Simplify: $\frac{12a^2+16a}{-4a}$

(a) $3a+16$ (b) $3a-4$ (c) $3a+4$

(d) $-3a-4$ (e) $-3a-16$

14) Multiply: $(3x-2)^2$

(a) $3x^2+4$ (b) $9x-4$ (c) $9x^2+4$

(d) $9x^2-12x+4$ (e) $3x^2-12x+4$

15) Divide: $2x-1\overline{)6x^2+x-2}$

(a) $3x+2$ (b) $x+2$ (c) $3x-2$

(d) $2x-1$ (e) none of these

5. Factor polynomials

16) Factor: $9x^3-15x^2$

(a) $x(9x^2-15x)$ (b) $x^2(9x-15)$ (c) $9x^2(x-15)$

(d) $3x(3x^2-5)$ (e) $3x^2(3x-5)$

17) Factor: $5x^2-15x-2x+6$

(a) $(x-3)(5x+2)$ (b) $(x-2)(x-3)$ (c) $(5x-2)(x-3)$

(d) $(5x+2)(x+3)$ (e) none of these

18) Factor: $9x^2-4$

(a) $(3x-2)(3x-2)$ (b) $(3x+2)(3x-2)$ (c) $(3x+2)^2$

(d) $3x(3x-2)$ (e) none of these

19) Factor: $2x^2-5x+3$

(a) $(2x+1)(x+3)$ (b) $(2x-3)(x+1)$ (c) $(2x-3)(x-1)$

(d) $(x-3)(x-1)$ (e) none of these

20) Solve: $x^2-5x+6=0$

(a) 2, 3 (b) $-2,3$ (c) $2,-3$

(d) $-2,-3$ (e) none of these

21) Solve: $x^2 - 18 = 3x$

(a) $-3, 6$ (b) $3, -6$ (c) $3, 6$

(d) $-3, -6$ (e) none of these

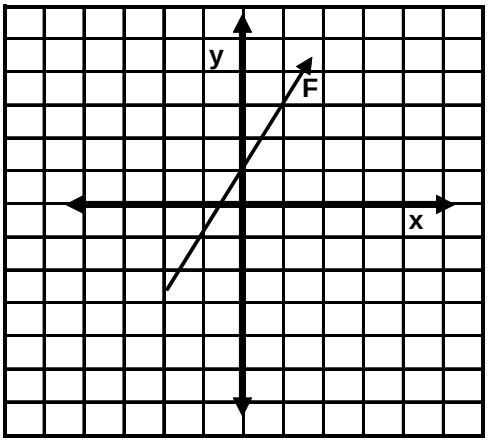
6. Equation of lines

22) Which of the following points lie on the graph of $4x - y = 9$?

(a) (2, 1) (b) (2, −1) (c) (0, 9)

(d) (1, 5) (e) (3, −3)

23) An equation for the line F is:



(a) $y = x$ (b) $y = x + 1$ (c) $y = 2x + 1$

(d) $y = 2x - 1$ (e) $y = x + 2$

24) Find the slope of the line that passes through the points (-1, 5) and (3, -1)

(a) $\frac{3}{2}$ (b) -1 (c) $-\frac{3}{2}$

(d) -2 (e) undefined

25) Find the slope of the line perpendicular to $2y - 4x - 18 = 0$

(a) -4 (b) 2 (c) $\frac{1}{2}$

(d) $-\frac{1}{2}$ (e) -2

26) Find the y-intercept of the equation $2x - 9y = 18$

(a) $(0, -9)$ (b) $(0, -\frac{1}{2})$ (c) $(0, -2)$

(d) (0, 2) (e) none of these

7. Word problems

27) In 2002, the most popular amusement parks in the United States were Disneyland and the Magic Kingdom at Walt Disney World. Disneyland had 1.3 million fewer visitors than the Magic Kingdom, and together they had 26.7 million visitors. How many visitors did Disneyland have?

(a) 12.7 million (b) 14 million (c) 25.4 million

(d) 28 million (e) none of these

28) A theater has n rows of seats and the number of seats in each row is 4 less than the number of rows. If all rows have the same number of seats, which of the following represents the total number of seats in the theater?

(a) $n(n-4)$ (b) $n+(n-4)$ (c) $n^2 - 4$

(d) $n(4-n)$ (e) $n^2 - 4$

29) Sarah worked 46.5 hours this week. Her hourly wage is $14.24 for the first 40 hours and 1.5 times that rate over 40 hours. Find her total earnings to the nearest dollar.

(a) $608 (b) $706 (c) $708

(d) $709 (e) none of these

30) A student is enrolled in a Marketing course. The student scores 85, 91, and 83 on three of her exam. What grade must she receive on her fourth exam in order to receive an average of 89?

(a) 87 (b) 95 (c) 97

(d) 89 (e) none of these

(31) A shoe-making company estimates that its weekly cost is $6,000 plus $80 for each pair of shoes produced. Each pair sells for $120. How many pair must be sold in order for the cost to be equal to the revenue? **[Revenue is the number units sold multiplied by the price.]**

(a) 150 (b) 15 (c) 200

(d) 30 (e) none of these

Introduction to Algebra
Answer Key

1.	**e**	**16.**	**e**	**31.**	**a**
2.	**e**	**17.**	**c**		
3.	**d**	**18.**	**b**		
4.	**c**	**19.**	**c**		
5.	**c**	**20.**	**a**		
6.	**e**	**21.**	**a**		
7.	**b**	**22.**	**b**		
8.	**c**	**23.**	**c**		
9.	**d**	**24.**	**c**		
10.	**d**	**25.**	**d**		
11.	**b**	**26.**	**c**		
12.	**d**	**27.**	**a**		
13.	**d**	**28.**	**a**		
14.	**d**	**29.**	**c**		
15.	**a**	**30.**	**c**		