

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

**Find the value of the exponential expression.**

1)  $\left(\frac{3}{7}\right)^3$

A)  $3\frac{3}{7}$

B)  $\frac{27}{343}$

C)  $\frac{343}{27}$

D)  $\frac{27}{7}$

**Simplify.**

2)  $-3^2$

A) 6

B) -9

C) 9

D) -6

**Evaluate.**

3)  $(-x)^2 - 2x$ , for  $x = -5$

A) -115

B) -3

C) -15

D) 35

**Decide if the given number is a solution of the equation.**

4)  $2y + 5(y - 2) = 11$ ; 3

A) Yes

B) No

**Simplify.**

5)  $2[-5 + 3(-7 + 2)]$

A) -40

B) 16

C) 20

D) -25

**Evaluate the expression for the given values.**

6)  $\frac{3x + 5y - 2}{2x + y}$ ;  $x = 4$ ,  $y = 1$

A)  $\frac{17}{9}$

B)  $\frac{5}{3}$

C)  $\frac{58}{9}$

D) 3

**Decide whether the statement is an example of the commutative, associative, identity, inverse, or distributive property.**

7)  $(1 + 5) + 2 = (5 + 1) + 2$

A) Distributive

B) Commutative

C) Associative

D) Identity

**Use the properties of real numbers to simplify the expression.**

8)  $-\frac{5}{7} + \frac{7}{8} + \frac{9}{8} + \frac{5}{7}$

A) 4

B) 8

C) 0

D) 2

**Simplify the expression by combining like terms.**

9)  $-2.9p + 5.8 - (7p + .2) + 5.8p$

A)  $9.9p + 6.0$

B)  $9.9p + 5.6$

C)  $-4.1p + 6.0$

D)  $-4.1p + 5.6$

Solve the equation.

10)  $3y + 7 = 8 - 5y$

A)  $\frac{1}{8}$

B)  $-\frac{2}{15}$

C) 8

D) -8

A formula is given along with the values of all but one of the variables in the formula. Find the value of the variable not given.

11)  $I = prt$ ;  $I = 32$ ,  $p = 200$ ,  $r = 0.02$

A) 1.28

B) 8

C) 0.8

D) 128

Express the phrase as a ratio in lowest terms.

12) 18 people to 15 people

A)  $\frac{6}{5}$

B)  $\frac{19}{16}$

C)  $\frac{5}{6}$

D)  $\frac{16}{19}$

Solve the equation.

13)  $\frac{x+5}{2} = \frac{3}{20}$

A) -94

B)  $\frac{53}{10}$

C)  $\frac{1}{20}$

D)  $-\frac{47}{10}$

Solve the problem.

14) Dr. Smith can see 8 patients in 2 hours. At this rate, how long would it take him to see 32 patients?

A) 7 hours

B) 8 hours

C) 16 hours

D) 128 hours

Answer the question about percent.

15) 40% of what number is 90?

A) 2250

B) 23

C) 225

D) 36

Add or subtract as indicated.

16)  $(a - 5b + 5) + (3a + b) + (a + 5)$

A)  $3a - 5b + 10$

B)  $2a - 3b + 10$

C)  $4a - 4b + 10$

D)  $5a - 4b + 10$

Simplify the expression. Use positive exponents. Assume variables represent nonzero real numbers.

17)  $(-r^2s)^2(-r^4s^3)^5$

A)  $-r^{16}s^{17}$

B)  $-r^{10}28s^{24}5$

C)  $r^{24}s^{17}$

D)  $-r^{24}s^{17}$

Evaluate as requested.

18) Evaluate the polynomial  $x^2 + 3y^2 + 2xy$  for  $x = 6$  and  $y = 3$ .

A) 117

B) 99

C) 63

D) 72

Multiply.

19)  $(9m - 2w)(9m + 2w)$

A)  $81m^2 + 36mw - 4w^2$

B)  $9m^2 - 2w^2$

C)  $81m^2 - 36mw - 4w^2$

D)  $81m^2 - 4w^2$

Find the product.

20)  $5x^2(4x^6 - 3x^3 - 9)$

A)  $20x^8 - 15x^5 - 45x^2$

B)  $20x^6 - 15x^3 - 45$

C)  $20x^8 - 15x^5$

D)  $20x^8 - 3x^3 - 9$

Find the square.

21)  $(4m + 5)^2$

A)  $16m^2 + 25$

B)  $16m^2 + 40m + 25$

C)  $4m^2 + 25$

D)  $4m^2 + 40m + 25$

Evaluate.

22)  $\frac{0^4}{(-4)^0}$

A) 0

B) -1

C) -4

D) 1

Evaluate the expression.

23)  $\left(\frac{2}{3}\right)^{-2}$

A)  $\frac{4}{9}$

B)  $-\frac{9}{4}$

C)  $\frac{9}{4}$

D)  $-\frac{4}{9}$

Simplify the expression. Use positive exponents. Assume variables represent nonzero real numbers.

24)  $\frac{x^{-3}}{x^{-8}}$

A)  $x^{11}$

B)  $x^{-11}$

C)  $x^{-5}$

D)  $x^5$

Use a combination of rules for exponents to simplify. Write answers with only positive exponents. Assume that all variables represent nonzero real numbers.

25)  $\left(\frac{t^2z}{t^{-3}z}\right)^{-4}$

A)  $\frac{t^8}{z^{12}}$

B)  $\frac{z^8}{t^{12}}$

C)  $\frac{t^{12}}{z^{16}}$

D)  $\frac{z^{12}}{t^{16}}$

Perform the division. Write the answer with positive exponents.

26)  $\frac{10x^8 + 15x^7 - 20x^5 + 20x^3 + 7x^2}{5x^5}$

A)  $10x^8 + 3x^2 - 4 + \frac{4}{x^2} + \frac{7}{5x^3}$

B)  $2x^3 + 15x^7 - 20x^5 + 20x^3 + 7x^2$

C)  $2x^3 + 3x^2 - 4 + \frac{4}{x^2} + \frac{7}{5x^3}$

D)  $2x^3 + 3x^2 - 4$

Write the number in scientific notation.

27) .000665

A)  $6.65 \times 10^{-3}$

B)  $6.65 \times 10^{-5}$

C)  $6.65 \times 10^4$

D)  $6.65 \times 10^{-4}$

Solve the equation.

28)  $4(2x - 1) = 16$

A)  $\frac{5}{2}$

B)  $\frac{17}{8}$

C)  $\frac{15}{8}$

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

29)  $6(x + 5) - (6x + 30) = 0$

A) 5

B) 0

C)  $\emptyset$

D) all real numbers

Solve the equation by first clearing the fractions.

30)  $\frac{2}{5}x - \frac{1}{3}x = 4$

A) -120

B) 60

C) 120

D) -60

Factor by grouping.

31)  $20x^2 - 25xy - 24xy + 30y^2$

A)  $(5x - 6)(4x - 5)$

B)  $(5x - 6y)(4x - 5y)$

C)  $(5x + 6y)(4x - 5y)$

D)  $(20x - 6y)(x - 5y)$

Solve the equation.

32)  $4x^2 - 9x = 9$

A)  $-\frac{3}{4}, -3$

B)  $-\frac{3}{4}, 0$

C)  $-\frac{3}{4}, 1$

D)  $-\frac{3}{4}, 3$

Perform the indicated operation. Simplify, if possible.

33)  $\frac{m^2 - 6m}{m - 2} + \frac{8}{m - 2}$

A)  $m - 4$

B)  $\frac{m^2 - 6m + 8}{m - 2}$

C)  $m - 2$

D)  $m + 4$

Factor completely. If unfactorable, indicate the polynomial is prime.

34)  $4k^2 - 25m^2$

A)  $(2k - 5m)^2$

B)  $(2k + 5m)(2k - 5m)$

C)  $(2k + 5m)^2$

D)  $(4k + m)(k - 25m)$

Factor completely.

35)  $4y^2 + 18y - 10$

A)  $(2y - 1)(2y + 10)$

B)  $(4y - 2)(y + 5)$

C)  $2(2y + 1)(y - 5)$

D)  $2(2y - 1)(y + 5)$

Solve the equation.

36)  $8c^3 - 32c^2 + 24c = 0$

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

B) 3, 1, 0

C) 0

D) 3, -3

Solve the problem.

37) A rectangle has a length of  $x + 3$  and a width of  $x - 3$ , and has an area of 40 square units. Find the length and width of the rectangle. ( $A = LW$ )

A) width = 4 units; length = 10 units

B) width = 1 unit; length = 40 units

C) width = 2 units; length = 20 units

D) width = 5 units; length = 8 units

Factor.

38)  $6x(3x - 4) + 5(4 - 3x)$

A)  $(18x + 5)(x - 4)$

B)  $(6x - 5)(3x - 4)$

C)  $(6x - 5)(3x + 4)$

D) Prime (does not factor)

Perform the indicated operation. Write the answer in scientific notation.

39)  $\frac{12 \times 10^7}{3 \times 10^{-5}}$

A)  $8 \times 10^2$

B)  $4 \times 10^2$

C)  $8 \times 10^{12}$

D)  $4 \times 10^{12}$

Write the number without exponents.

40)  $1.238 \times 10^6$

A) 74.28

B) 1,238,000

C) 12,380,000

D) 123,800

Passaic County Community College  
Final Exam MA006  
Summer 2006

Multiple Choice. Select the answer that best satisfies each question.

- 1) Simplify:  $5 - 3(2 + 3)^2$   
A) -50      B) 50      C) -70      D) -80      E) None of these
- 2) Simplify:  $4(3 + 2b)$   
A)  $12 + 8b$       B) 20      C)  $12 + 2b$       D)  $8b + 3$       E) None of these
- 3) Evaluate  $a^2 - b^2$  if  $a = -2$ ,  $b = -3$   
A) 11      B) 5      C) -5      D) 0      E) None of these
- 4) Solve:  $X + 6 = -1$   
A) -7      B)  $1/6$       C) 5      D) 0      E) No solution
- 5) Which property is being demonstrated?  $4(3) = (3)(4)$   
A) Associative      B) Commutative      C) Identity      D) Inverse      E) Distributive
- 6) Solve:  $\frac{2}{3}x = -4$   
A) 6      B) -6      C)  $-4\frac{2}{3}$       D) 9      E) No solution
- 7) Solve:  $2(t + 2) + 4(1 - t) = -8$   
A)  $\frac{33}{5}$       B) -5      C) 6      D) 8      E) No solution
- 8) Solve:  $1.2x - 0.4 = 0.3(x + 1)$   
A)  $-\frac{17}{9}$       B) 0      C)  $\frac{7}{9}$       D)  $\frac{2}{5}$       E) No solution

9) Solve for b:  $ab + c = d$

- A)  $d - c - a$       B)  $b(d - c)$       C)  $\frac{d}{a} - c$       D)  $\frac{(d - c)}{a}$       E) None of these

10) Solve:  $x - 5 \leq 2x + 1$

- A)  $x \geq 6$       B)  $x \leq 6$       C)  $x \geq -6$       D)  $x \leq -6$       E) None of these

11) Simplify:  $4x^2y + 2xy^2 - 3xy^2$

- A)  $3x^2y$       B)  $3x^2y^4$       C)  $4x^2y - xy^2$       D)  $2xy^2 + x^2y$       E) None of these

12) Susan is 24 years older than her son Jack. In two years, Susan will be three times as old as Jack. How old is Susan now?

- A) 10 years      B) 12 years      C) 20 years      D) 34 years

13) Simplify:  $\frac{x^{12}}{x^{-2}}$

- A)  $x^{10}$       B)  $x^{14}$       C)  $\frac{1}{x^{14}}$       D) 10      E) None of these

14) Simplify:  $(-3a^2b^3)(4a^5b)$

- A)  $-12a^7b^3$       B)  $12a^{10}b^3$       C)  $-12a^{10}b^3$       D)  $-12a^7b^4$       E) None of these

15) Simplify:  $(r^3t^{-2})^2(r^4t^3)^{-1}$

- A)  $\frac{r^2}{t^7}$       B)  $\frac{r}{t}$       C)  $r^{10}t$       D)  $\frac{r^{10}}{t}$       E)  $\frac{r^2}{t}$

16) Add:  $\frac{1}{4x} + \frac{5}{2x^2}$

- A)  $\frac{6}{6x^2}$       B)  $\frac{3}{2x^2}$       C)  $\frac{x+10}{2x^2}$       D)  $\frac{x+10}{4x^2}$       E) None of these

17) Write in scientific notation: 2030000

- A)  $0.203 \times 10^{-7}$       B)  $2.03 \times 10^{-6}$       C)  $203 \times 10^4$       D)  $2.03 \times 10^6$       E) None of these

18) Simplify:  $\frac{4.8 \times 10^7}{0.2 \times 10^4}$

- A) 24000      B) 2400      C) .024      D) .0024      E) None of these

19) Multiply:  $(3b + 2)(5b - 1)$

- A)  $15b^2 - 2$       B)  $15b^2 - 13b - 2$       C)  $15b^2 + 7b - 2$       D)  $15b^2 + 7b + 2$       E) None of these

20) Expand:  $(4x - 1)^2$

- A)  $16x^2 + 1$       b)  $16x^2 - 1$       C)  $16x^2 - 4x + 1$       D)  $16x^2 - 8x + 1$       E) None of these

21) Divide:  $\frac{4a^2b^3 - 8a^3b^2}{4ab^2}$

- A)  $ab - 4a^2b$       B)  $ab - 2a^2$       C)  $a^2 - b^2$       D)  $-a^4b^3$       E) None of these

22) Divide:  $\frac{2x^2 + 7x + 6}{x + 2}$

- A)  $x + 2 + \frac{1}{x + 2}$       B)  $2x + 3$       C)  $2x + 3 - \frac{5}{x + 2}$       D)  $2x + 3 + \frac{1}{x + 2}$       E) None of these

23) Factor:  $x^2 - 3x - 28$

- A)  $(x - 7)(x + 4)$       B)  $(x - 2)(x + 5)$       C)  $(x + 7)(x - 4)$       D)  $(x - 5)(x - 2)$       E) Prime

24) Factor:  $9x^2 + 16$

- A)  $(3x + 4)^2$       B)  $(3x + 4)(3x - 4)$       C)  $(9x + 4)(x + 4)$       D)  $(3x - 4)^2$       E) Prime

25) Factor:  $20m^2 - 7m - 6$

- A)  $(5m - 2)(4m - 3)$       B)  $(2m - 3)(6m + 2)$       C)  $(5m + 2)(4m - 3)$       D)  $(5m - 2)(4m + 3)$       E) Prime

26) Factor:  $2x^3 - 18x^2 + 16x$

- A)  $2x(x - 8)(x - 1)$       B)  $2x(x - 8)(x + 1)$       C)  $2x(x + 8)(x - 1)$       D)  $(2x + 16)(x^2 - 1)$       E) Prime

27) Factor:  $2y + 6 - xy - 3x$

- A)  $(2+x)(y-3)$     B)  $(2-x)(y-3)$     C)  $(2-x)(y+3)$     D)  $(2-y)(x+3)$     E) Prime

28) Solve:  $x^2 + 3x = 0$

- A) -3                      B) 0, -3                      C) 3                      D) 0,3                      E) No solution

29) Solve:  $(x+2)^2 = x+14$

- A) -2,-14                      B) 2,-5                      C) 5, 8                      D) -2,6                      E) No solution

30) Solve:  $x^3 = 9x$

- A) 0, 9                      B) 0, 3                      C) -3,3                      D) 0,3, -3                      E) No solution

31) The width of a rectangle is 4 more than twice the length. Find the width if the area is  $30 \text{ ft}^2$

- A) 2ft                      B) 10ft                      C) 8ft                      D) 12ft                      E) None of these

32) Reduce to lowest terms:  $\frac{m^2 - 6m + 9}{m^2 - 9}$

- A) -6m                      B) -1                      C)  $\frac{m-3}{m+3}$                       D)  $\frac{m+3}{m-3}$                       E) None of these

33) Multiply:  $\frac{5a^2}{3b} \times \frac{6b^2}{10ab}$

- A) a                      B)  $\frac{a}{b}$                       C)  $\frac{5b}{2a}$                       D) b                      E) None of these

34) Divide:  $\frac{2x^2 + 2x}{x+2} \div \frac{6x^2 - 6}{4x+8}$

- A)  $\frac{4x}{3(x-1)}$                       B)  $\frac{4}{(3x-3)}$                       C)  $\frac{2(x+4)}{3x^2-1}$                       D)  $\frac{6(x+1)^2(x-1)}{2(x+2)^2}$                       E) None of these

35) Subtract:  $\frac{5}{x} - \frac{2}{y}$

- A)  $\frac{1}{10xy}$       B)  $\frac{5y-2x}{xy}$       C)  $\frac{5x-2y}{xy}$       D)  $\frac{3}{xy}$       E) None of these

36) Solve:  $\frac{2}{x} = \frac{7}{3}$

- A) 6/7      B) 7/6      C) 21      D)  $\frac{2}{5}$       E) No solution

37) Solve:  $\frac{5}{3} - \frac{1}{x} = 1$

- A)  $\frac{3}{2}$       B)  $\frac{2}{3}$       C) -2      D) 5, -3      E) No solution

38) Solve:  $\frac{x-4}{x+1} + \frac{4}{x} = \frac{29}{30}$

- A) 5      B) 24      C) 5,24      D) 0, -1      E) No solution

39) A solution contains 8ml of alcohol and 24 ml of water. How much water is needed if there are 60ml of alcohol?

- A) 20ml      B) 15ml      C) 80ml      D) 120ml      E) None of these

40) Simplify:  $\frac{6^{-1}}{5^0}$

- A)  $-\frac{6}{5}$       B) undefined      C)  $\frac{1}{6}$       D) -6      E) None of these

MA 006	Spring 2006	Summer 2006
1.	B	C
2.	B	A
3.	D	C
4.	A	A
5.	A	B
6.	B	B
7.	B	D
8.	D	C
9.	D	D
10.	A	C
11.	B	C
12.	A	D
13.	D	B
14.	B	D
15.	C	A
16.	D	D
17.	D	D
18.	B	A
19.	D	C
20.	A	D
21.	B	B
22.	A	B
23.	C	A
24.	D	E
25.	D	C
26.	C	A
27.	D	C
28.	A	B
29.	D	E
30.	B	D
31.	B	B
32.	D	C
33.	A	A
34.	B	A
35.	D	B
36.	B	A
37.	A	A
38.	B	C
39.	D	E
40.	B	C