MA 120 Calculus & Its Applications Name_____
Prerequisite Assessment 2 Instructor: Kristine King
Spring 2009

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

1) Describe the domain of the function $f(x) = \frac{1}{(x-1)^2(x-3)}$. 1) _____

A) $x \neq 1, 3$
B) $x = 1, 3$
C) $x \neq 1$, and $f(0) = \frac{1}{3}$
D) $x \neq -1, -3$, and $f(2) = 1$
E) none of the above

2) For $f(x) = -x^2 + 3x + 1$ compute $f(x + 1)$. 2) _____

F) $-x^2 + x + 3$
G) $-x^2 + 3x + 3$
H) $-x^2 + 3x + 5$
J) $-x^2 + 5x + 5$
K) none of the above

3) If $f(x) = \frac{2x}{x^2 + 1}$, find $f(-2)$. 3) _____

A) $\frac{4}{3}$ B) $\frac{4}{5}$ C) -2 D) $-\frac{4}{5}$ E) 0

4) Determine the y–intercept of the graph of the following function: $y = 3x + 8$. 4) _____

F) $\left(0, -\frac{8}{3}\right)$
G) (0, 8)
H) $\left(-\frac{8}{3}, 0\right)$
J) (8, 0)
K) none of the above

5) Find the point(s) of intersection of the pair of curves $y = x^3 - x$ and $y = 3x$. 5) _____

A) (0, 0) and (1, 0)
B) (0, 0)
C) (0, 0) , (4, 0) and (–4, 0)
D) (0, 0) , (2, 6) , and (–2, –6)
E) none of the above

Provide an appropriate response.

6) $\frac{x^3 + 4x^2 - 12x}{4x}$ 6) _____

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

G) $\frac{x^2}{4} - 4x^2 - 12x$

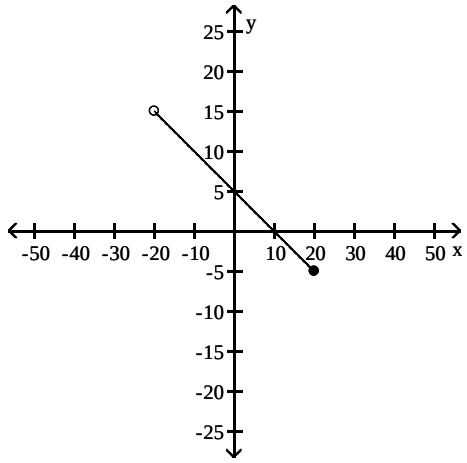
H) $5x^2 - 12x$

J) $\frac{x^2}{4} + x - 3$

K) $x^3 - 11x$

Solve the problem.

7) Write the domain and range of the function using interval notation. 7) _____



A) domain: (–20, 20]
range: [–5, 15)

B) domain: (–5, 15]
range: [–20, 20)

C) domain: [–5, 15)
range: (–20, 20]

D) domain: [–20, 20)
range: (–5, 15]

8) To convert a temperature from degrees Celsius to degrees Fahrenheit, you multiply the temperature in degrees Celsius by 1.8 and then add 32 to the result. Express F as a linear function of c. 8) _____

F) F(c) = 33.8c G) F(c) = 1.8 + 32c H) $F(c) = \frac{c - 32}{1.8}$ J) F(c) = 1.8c + 32

Evaluate the expression. Write your answer without negative exponents.

9) -4^2 9) _____

A) –16 B) 16 C) 8 D) –8

Simplify the expression. Write your answer without negative exponents. Whenever an exponent is negative or zero, assume that the base is not zero.

10) $\frac{x^4}{x^{-5}}$ 10) _____

F) $\frac{1}{x^1}$ G) x^9 H) $\frac{1}{x^9}$ J) $-x^1$

11) $(12x^3)^2$ 11) _____

A) $144x^3$ B) $144x^6$ C) $12x^6$ D) $12x^5$

Simplify the rational expression. Find all numbers that must be excluded from the domain of the simplified rational expression.

12) $\frac{4x^2 - 43x + 63}{x - 9}$ 12) _____

F) $4x^2 - 50$, no restrictions on x G) $\frac{4x^2 - 43x + 63}{x - 9}$, $x \neq 9$

H) $\frac{1}{x - 9}$, $x \neq 9$ J) $4x - 7$, $x \neq 9$

Calculate.

13) $3 \cdot 3 - 4 \cdot 7^2 + 9(2 - 9)$ 13) _____

A) −63 B) −178 C) −838 D) −250

Solve.

14) $8x - (6x - 1) = 2$ 14) _____

F) $\frac{1}{2}$ G) $-\frac{1}{14}$ H) $\frac{1}{14}$ J) $-\frac{1}{2}$

Simplify the radical expression by factoring out the largest perfect nth power. Assume that all variables are positive.

15) $\sqrt{72}$ 15) _____

A) $36\sqrt{2}$ B) 6 C) 8 D) $6\sqrt{2}$

Solve.

16) $4x^2 - 8x = 0$ 16) _____

F) 0, 2 G) 2 H) 4, 2 J) 4

17) $x^2 - 14x + 49 = 49$ 17) _____

A) 0, −14 B) 7, −7 C) 14, 0 D) 56

Evaluate the expression without using a calculator.

18) $64^{1/2}$ 18) _____

F) 16 G) 8 H) 4 J) 32

Factor the polynomial as the difference of two squares.

19) $36x^2 - 121$ 19) _____

A) $(6x + 11)(6x - 11)$ B) $(6x + 11)^2$

C) $(6x - 11)^2$ D) prime

Perform the indicated operations. Write the resulting polynomial in standard form.

20) $(9x^5 - 10x^4 + 2) - (3x^5 + 15x^4 - 10)$ 20) _____

F) $6x^5 - 25x^4 - 8$ G) $6x^5 - 7x^4 - 8$ H) $-7x^9$ J) $6x^5 - 25x^4 + 12$

21) $7x(7x + 12)$ 21) _____

A) $133x^2$ B) $49x^2 + 84x$ C) $49x^2 + 12x$ D) $7x^2 + 84x$

Factor the polynomial by removing any common monomial factor.

22) $5t^2 - 10t - 25$ 22) _____

F) $5(t^2 - 2t - 5)$ G) $5(t^2 - 5t - 20)$ H) $5(t^2 - 10t - 25)$ J) $5t(t^2 - 2t - 5)$

Factor the trinomial, or state that the trinomial is prime.

23) $x^2 + 3x - 10$ 23) _____

A) $(x - 5)(x + 2)$ B) $(x - 5)(x + 1)$ C) $(x + 5)(x - 2)$ D) prime

Perform the indicated operations. Write the resulting polynomial in standard form.

24) $(10x - y)^2$ 24) _____

F) $100x^2 - 20xy - 2y^2$ G) $100x^2 - 20xy + y^2$

H) $100x^2 - 10xy + y^2$ J) $100x^2 + y^2$

25) $(x + 11y)(x + 8y)$ 25) _____

A) $x^2 + 16xy + 88y^2$ B) $x^2 + 19xy + 88y^2$

C) $x^2 + 19xy + 19y^2$ D) $x + 19xy + 88y$

Simplify the expression. Write your answer without negative exponents. Whenever an exponent is negative or zero, assume that the base is not zero.

26) $(x^2)^3$ 26) _____

F) x^5 G) $3x^2$ H) x^6 J) $3x^6$

Evaluate the expression. Write your answer without negative exponents.

27) 5^{-4} 27) _____

A) $\frac{1}{20}$ B) -625 C) $\frac{1}{625}$ D) 625

28) 4^0 28) _____

F) 1 G) 4 H) 0 J) -1

Simplify the expression. Write your answer without negative exponents. Whenever an exponent is negative or zero, assume that the base is not zero.

29) $(-4x^6)(2x^2)$ 29) _____

A) $8x^{12}$ B) $8x^8$ C) $-8x^8$ D) $-8x^{12}$

Provide an appropriate response.

30) Factoring $(x + 1)(x - 3) + (x + 7)(x - 3)$ gives 30) _____

F) $2(x - 3)(x + 4)$

G) $(x + 1)(x + 7)(x - 3)$

H) $2(x - 3)(x + 8)$

J) $(x - 3)(2x - 2)$

K) $(x + 1)(x + 7)(x - 3)^2$

31) Solve for x: $1 - 4x - 4x^2 = 0$ 31) _____

A) $2 \pm 2\sqrt{2}$ B) $\frac{1}{2} \pm \frac{1\sqrt{2}}{2}$ C) $\frac{1}{2}$ D) $-\frac{1}{2} \pm \frac{\sqrt{2}}{2}$ E) $-2 \pm 2\sqrt{2}$

Solve.

32) $7x + 5 = 3x - 15$ 32) _____

F) -20 G) 5 H) $-\frac{15}{4}$ J) -5

Simplify the expression. Write your answer without negative exponents. Whenever an exponent is negative or zero, assume that the base is not zero.

33) $x \cdot x^{12}$ 33) _____

A) $2x^{12}$ B) $2x^{13}$ C) x^{12} D) x^{13}