Name _____

Introduction to Calculus (4522)
Summer Homework Assignment

This summer assignment is for students who will be entering Introduction to Calculus in September. This course is a college level Calculus I course and students will be expected to put in college level work and effort. This summer packet contains a few of the necessary skills required to be successful in this course. **Assignment is due on September 9 at the beginning of class. No late work or excuses will be accepted.**

You must:
- Print the PDF – both Multiple Choice and the Factoring
- Complete the assignment **showing all work** on the PDF
  (to be handed in at the beginning of class on 9/9/19)

Good Luck!!!

_____

"On my honor, I have neither given nor received any unauthorized aid on this Summer Packet."

Signature_____

Intro to Calc Summer Packet 2019

Name: _____   Date: _____

1. What is the slope of the line perpendicular to the line represented by the equation $2x + 4y = 12$?

   A. -2 B. 2

   C. $-\dfrac{1}{2}$ D. $\dfrac{1}{2}$

4. If $x - 3$ is a factor of $x^2 + x - 12$, then the other factor is

   A. $4x - 3$ B. $3x - 4$

   C. $x - 4$ D. $x + 4$

2. The equation of a line is $y = \dfrac{2}{3}x + 5$. What is an equation of the line that is perpendicular to the given line and that passes through the point $(4, 2)$?

   A. $y = \dfrac{2}{3}x - \dfrac{2}{3}$ B. $y = \dfrac{3}{2}x - 4$

   C. $y = -\dfrac{3}{2}x + 7$ D. $y = -\dfrac{3}{2}x + 8$

5. Written in factored form, the binomial $a^2 b - ab^2$ is equivalent to

   A. $ab(a - b)$ B. $(a - b)(a + b)$

   C. $a^2(b - b^2)$ D. $a^2 b^2(b - a)$

6. Written in factored form, the trinomial $3x^2 + 5x - 2$ is equivalent to

   A. $(3x + 1)(x - 2)$

   B. $(3x - 1)(x + 2)$

   C. $(3x + 2)(x - 1)$

   D. $(3x - 2)(x + 1)$

3. Which equation represents a line that is parallel to the line whose equation is $3x - 2y = 7$?

   A. $y = -\dfrac{3}{2}x + 5$ B. $y = -\dfrac{2}{3}x + 4$

   C. $y = \dfrac{3}{2}x - 5$ D. $y = \dfrac{2}{3}x - 4$

7. When factored completely, $m^5 + m^3 - 6m$ is equivalent to

   A. $(m + 3)(m - 2)$

   B. $(m^3 + 3m)(m^2 - 2)$

   C. $m(m^4 + m^2 - 6)$

   D. $m(m^2 + 3)(m^2 - 2)$

8. The expression $\left(\dfrac{m^2}{m^{\frac{1}{3}}}\right)^{-\frac{1}{2}}$ is equivalent to

   A. $-\sqrt[6]{m^5}$ B. $\dfrac{1}{\sqrt[6]{m^5}}$

   C. $-m\sqrt[5]{m}$ D. $\dfrac{1}{m\sqrt[5]{m}}$

9. The solution to the equation $18x^2 - 24x + 87 = 0$ is

   A. $-\frac{2}{3} \pm 6i\sqrt{158}$ B. $-\frac{2}{3} \pm \frac{1}{6}i\sqrt{158}$

   C. $\frac{2}{3} \pm 6i\sqrt{158}$ D. $\frac{2}{3} \pm \frac{1}{6}i\sqrt{158}$

10. What is the solution, if any, of the equation.

$$\frac{2}{x + 3} - \frac{3}{4 - x} = \frac{2x - 2}{x^2 - x - 12}?$$

   A. -1

   B. -5

   C. all real numbers

   D. no real solution

11. When $b > 0$ and d is a positive integer, the expression $(3b)^{\frac{2}{d}}$ is equivalent to

   A. $\dfrac{1}{\left(\sqrt[d]{3b}\right)^2}$ B. $\left(\sqrt{3b}\right)^d$

   C. $\dfrac{1}{\sqrt{3b^d}}$ D. $\left(\sqrt[d]{3b}\right)^2$

12. The solution set for the equation $\sqrt{56 - x} = x$ is

   A. $\{-8, 7\}$ B. $\{-7, 8\}$

   C. $\{7\}$ D. $\{\}$

13. The zeros for $f(x) = x^4 - 4x^3 - 9x^2 + 36x$ are

A. $\{0, \pm 3, 4\}$ B. $\{0, 3, 4\}$

C. $\{0, \pm 3, -4\}$ D. $\{0, 3, -4\}$

14. If $g(c) = 1 - c^2$ and $m(c) = c + 1$, then which statement is *not* true?

A. $g(c) \cdot m(c) = 1 + c - c^2 - c^3$

B. $g(c) + m(c) = 2 + c - c^2$

C. $m(c) - g(c) = c + c^2$

D. $\dfrac{m(c)}{g(c)} = \dfrac{-1}{1 - c}$

15. A solution of the equation $2x^2 + 3x + 2 = 0$ is

A. $-\frac{3}{4} + \frac{1}{4}i\sqrt{7}$ B. $-\frac{3}{4} + \frac{7}{4}i$

C. $-\frac{3}{4} + \frac{1}{4}\sqrt{7}$ D. $\frac{1}{2}$

16. The expression $\dfrac{4x^3 + 5x + 10}{2x + 3}$ is equivalent to

A. $2x^2 + 3x - 7 + \dfrac{31}{2x + 3}$

B. $2x^2 - 3x + 7 - \dfrac{11}{2x + 3}$

C. $2x^2 + 2.5x + 5 + \dfrac{15}{2x + 3}$

D. $2x^2 - 2.5x - 5 - \dfrac{20}{2x + 3}$

17. The equation $4x^2 - 24x + 4y^2 + 72y = 76$ is equivalent to

A. $4(x - 3)^2 + 4(y + 9)^2 = 76$

B. $4(x - 3)^2 + 4(y + 9)^2 = 121$

C. $4(x - 3)^2 + 4(y + 9)^2 = 166$

D. $4(x - 3)^2 + 4(y + 9)^2 = 436$

18. The expression $(x^2 z^3)(xy^2 z)$ is equivalent to

A. $x^2 y^2 z^3$ B. $x^3 y^2 z^4$

C. $x^3 y^3 z^4$ D. $x^4 y^2 z^5$

19. The expression $\dfrac{\dfrac{1}{3} + \dfrac{1}{3x}}{\dfrac{1}{x} + \dfrac{1}{3}}$ is equivalent to

A. $\dfrac{x+1}{x+3}$ B. 2

C. $\dfrac{3x+3}{x+3}$ D. $\dfrac{1}{3}$

20. Which is an equation of the line that has a y-intercept of -2 and is parallel to the line whose equation is $4y = 3x + 7$?

A. $y = \frac{3}{4}x - 2$ B. $y = \frac{3}{4}x + 2$

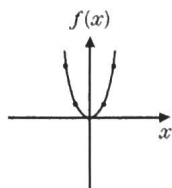C. $y = \frac{4}{3}x - 2$ D. $y = -\frac{4}{3}x - 2$

21. What are the roots of the equation $x^2 + 3x - 5 = 0$?

A. $\dfrac{-3 \pm \sqrt{29}}{2}$ B. $\dfrac{3 \pm \sqrt{29}}{2}$

C. $\dfrac{-3 \pm \sqrt{11}}{2}$ D. $\dfrac{3 \pm \sqrt{11}}{2}$

22. What is an equation of the line parallel to the line whose equation is $2x + y = 6$ and that passes through the point $(0, -1)$?

A. $x + 2y = -1$ B. $y = -1$

C. $2x + y = 1$ D. $y = -2x - 1$

23. In the diagram at the right, the function $f(x) = x^2$ is represented graphically. Which graph below represents the inverse of $f(x)$?

$f(x)$

A.

$f(x)$

B.

$f(x)$

C.

$f(x)$

D.

$f(x)$

24. If $\cos x = -\frac{4}{5}$ and $\tan x > 0$, the value of $\sin x$ is

A. $\frac{3}{5}$ B. $\frac{5}{3}$ C. $-\frac{5}{3}$ D. $-\frac{3}{5}$

25. If the terminal side of angle θ passes through the point $(-4,3)$, what is the value of $\cos \theta$?

A. $\frac{3}{5}$ B. $-\frac{3}{5}$ C. $\frac{4}{5}$ D. $-\frac{4}{5}$

26. If $\tan x = -\frac{2}{3}$ and angle x lies in the second quadrant, what is the value of $\cos x$?

A. $\frac{3\sqrt{5}}{5}$ B. $-\frac{3\sqrt{5}}{5}$

C. $\frac{3\sqrt{13}}{13}$ D. $-\frac{3\sqrt{13}}{13}$

27. What is the inverse of the function $y = 2x + 3$?

A. $x = \frac{1}{2}y - \frac{3}{2}$ B. $y = \frac{1}{2}x - \frac{3}{2}$

C. $y = 2x - 3$ D. $x = -2y - 3$

Factor each polynomial completely.

Remember! Try in order of GCF → DOTS → Trinomials → Grouping → Cubes

1. $4x^2 + 5x$

2. $72 - 2x^2$

3. $3x^3 + 5x^2 + 7x$

4. $a^2b + a^4b^2$

5. $10a^2b - 15ab - 4a + 6$

6. $x^2 + 5x + 4$

7. $2x^2 - 8x - 90$

8. $3x^3 + 6x^2 - 27x - 54$

9. $x^4 - 16$

10. $3a^3 - 9a^2 - 54a$

11. $p^2 - 24p + 63$

12. $wz^4 + 2wz^3 - 80wz^2$

13. $3x^2y - 6xy - 45y$

14. $4y^3 + 12y^2 - 72y$

15. $3x^2 + 15x + 18$

16. $10p^2 - 100p + 90$

17. $4x^2 + 5x + 1$

18. $3c^2 - 13c + 4$

19. $x^2 - 24x$

20. $4x^2 - 1$

21. $6x^5y - 6xy^5$

22. $81 - x^4$

23. $ay^2 - by^2 - 9a + 9b$

24. $3y^2 - 147$

25. $x^2 - y^2 + 10y - 25$

26. $x^2 + 4xy + 4y^2 - 25$

27. $8x^3 - 1$

28. $b^2 - bx - 2b + 2x$

29. $3d^3 + 81$

30. $x^2 - 6x + 9 - 36y^2$