

## Calculus Summer 2019 Math Packet

*This packet of material consists of topics/skills that we expect students to know upon their arrival to Calculus this fall. All topics have been previously taught in math courses that precede Calculus. Completion of this packet before the start of the school is strongly suggested and will be collected on the third day that your class meets. It will be 15 points, 1 point for every 3 problems completed. (There are 45 total parts) We will address any questions that you have about the content of this packet because an assessment will be given by all Calculus teachers solely on these topics to check for student understanding. It is your responsibility to make sure that you ask questions and understand the review material before the assessment is administered, within the first week of class. The grade on this assessment and completion grade will be included with your first marking period grades for the course. If you need clarification on a topics during the summer, consider consulting Internet resources, textbook, or your notes from previous math courses.*

Please complete on a **separate** sheet of paper:

- Evaluate the expression when  $x = -1$ ,  $y = 3$ , and  $z = -1$        $x^3 + 3y - z^2$
- Perform the indicated operation:
  - $(2x^2 - 3x + 7) - (5x^2 - 8x - 9)$
  - $(y - 4)^2$
  - $(2x - 1)(x^2 + 3x - 4)$
  - $\frac{18a^2b^2}{27xy^3} \cdot \frac{10xy^2}{8ab^2}$
  - $\frac{2x+8}{3y-15} \div \frac{x^2+7x+12}{y^2-10y+25}$
  - $\frac{4}{x^2-1} + \frac{2}{x^2-3x+2}$
- Factor each polynomial completely:
  - $3x^2y^3 - 6x^3y^2 + 15x^2y^2$
  - $2ac - 3ad - 8bc + 12bd$
  - $8x^2 - 14x - 15$
  - $6x^2 - 21x - 12$
  - $21x^2 - 23xy - 20y^2$
  - $m^4 - 13m^2 + 36$
- Solve each equation:

a.  $6(x - 1) - 4(2x + 8) = 2 - 5(x + 2)$

b.  $\frac{1}{4}x - 7 = \frac{2x}{3} + \frac{1}{2}$

c.  $\frac{x-1}{5} = \frac{3-2x}{4}$

d.  $(x - 2)(x + 1) = 4$

5. Solve the inequality, leaving your answer in interval notation:

$$6x - 8(x + 2) \leq 5 - (x + 14)$$

6. Solve the equation for the given variable:

a.  $2x + 4y = ay - bx$  solve for y

b.  $\frac{5}{a} + \frac{c}{2b} = \frac{7}{3a}$  solve for a

7. Simplify each expression:

a.  $(2x^2y^{-3})^{-3}$

b.  $\frac{6x^{-2}y^5}{15x^4y^{-2}}$

8. Simplify each radical:

a.  $\sqrt{72x^3y^4}$

b.  $\sqrt[2]{126x^{13}y^9}$

9. Find the slope of each line. If there is no slope, write undefined.

a. through (-5, 2) and (8, 1)

b. through the origin and (-4, 2)

c.  $-4x - 3y = 2$

d.  $5x + 6 = 23$

e.  $-3x = 24y$

f. through (-3, 5) and parallel to the line with slope =  $-\frac{1}{3}$

10. Write the equation of the line in standard form:

a. through points (-3, 14) and (5, 2)

b. through points (3, -7) and (3, 5)

c. through  $(4, 2)$  and perpendicular to the line  $2x - 5y = 10$

d. parallel to  $x = 6$  and through the point  $(-8, 4)$ .

11. Graph the following lines:

a.  $5y - 4x = -15$

b.  $y - 7 = -9$

c.  $x = -4$

12. For a new T shirt company, 34 shirts will be supplied at a total price of \$240, while 100 shirts will be supplied at a total price of \$500. Write a linear supply function for this product.

13. Find a linear cost function given fixed cost is \$3200 and that 24 units cost \$6015.

14. Use the following data to complete the following:

Initial Value	Final Value
2	123
6	145
8	167
10	189
12	190
16	201
20	222
32	234

- a. Find the equation of the least squares line,  $y = mx + b$
- b. Predict the final value for an initial value of 34
- c. Find  $r$ .
15. CHS Inc reimburses its employees \$95 per day for food and lodging, plus \$0.22 per mile driven. Write a linear equation for the daily cost  $C$  in terms of  $x$ , the number of miles driven.
16. The number of subscribers to Cooking Light magazine in the years 2000 and 2012 were 7.2 million and 9.5 million respectively. Assume the relationship between the years and the number of subscribers is linear.
- a. Write an equation that gives the number of subscribers in terms of years. Let  $t = 0$  represent 2000.
- b. Estimate the number of subscribers there will be in 2018.