Robbinsville High School
Mathematics Department
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Robbinsville NJ 08691

Dear Parents and Guardians,

We would like to take this opportunity to thank you for your support this year. Attached you will find a packet for math reinforcement for your student's use over the summer. This packet should be completed and returned to school with your student on the ***first full day of school***. September is filled with review, but with completion of this packet, the review will come very naturally. The packet will be **collected** and ***graded*** as **a large *homework grade*** based on ***completion*** and ***effort***.

In addition to this packet, we have provided for your student some resources for extra help. Below, you will find a variety of websites your student may want to visit over the summer to refresh their memory about the topics discussed in this packet.

Math Forum at Drexel University: http://mathforum.org/dr.math/

Purple Math: http://www.purplemath.com/

Math Is Fun?: http://www.mathsisfun.com/

Cut the Knot: http://www.cut-the-knot.org/MathHelp.shtml

Cool Math (Algebra I): http://coolmath.com/algebra/Algebra1/index.html

Thank you again for your support throughout the year and we wish you a happy and safe summer vacation.

Happy Summer!

Robbinsville High School Mathematics Department

Directions: Factoring quadratic expressions with $a = 1$. Factor each completely.

1) $x^2 - 3x - 18$

2) $x^2 + 6x - 40$

3) $x^2 - 15x + 56$

4) $x^2 - 6x + 8$

5) $x^2 - 14x + 40$

6) $x^2 - 3x - 54$

Directions: Factoring quadratic expressions with $a > 1$. Factor each completely.

7) $3x^2 + 4x + 4$

8) $3x^2 - 10x - 25$

9) $3x^2 - 7x - 10$

10) $3x^2 + 23x + 40$

11) $3x^2 - x - 2$

12) $4x^2 - 27x + 18$

Directions: Factoring quadratic expressions with Difference of Two Squares. Factor each completely.

13) $9x^2 - 16$

14) $9x^2 - 1$

15) $16x^2 - 25$

16) $25x^2 - 16$

17) $p^2 - 25$

18) $16x^2 - 9$

Directions: Factoring quadratic expressions with a Greatest Common Factor and $a = 1$ or a>1. Factor each completely.

19) $3x^2 + 9x + 6$

20) $6x^4 - 6x^3 - 36x^2$

21) $10x^3 - 44x^2 + 16x$

22) $30x^2 + 66x - 216$

Directions: Solve for the zeros by factoring or by using quadratic formula if needed.

23) $x^2 + 9x - 36 = 0$

24) $6x^2 - 13x - 5 = 0$

25) $4x^2 + 7x - 10 = 0$

26) $-x^2 + 6x + 1 = 0$

Directions: Divide each of the polynomials using long division.

27) $(4x^2 - 9) \div (2x + 3)$

28) $(2x^2 + 5x - 3) \div (x - 3)$

Directions: Divide each of the polynomials using long division.

29) $(11x + 20x^2 + 12x^3 + 2) \div (3x + 2)$

30) $(12x^3 + 2 + 11x + 20x^2) \div (2x + 1)$

Directions: Divide each of the polynomials using synthetic division.

31) $(p^4 + 5p^3 - 11p^2 - 25p + 29) \div (p + 6)$

32) $(y^4 - 8y^3 + 10y^2 + 2y + 4) \div (y - 2)$

33) $(8v^5 + 32v^4 + 5v + 20) \div (v + 4)$

34) $(3x^3 - 4x^2 - 17x + 6) \div (3x - 1)$

Directions: Simplify completely. State any restrictions on the domain.
(remember to factor when necessary).

35) $\dfrac{2x+6}{4x-12}$

36) $\dfrac{x^2+9x+2}{2x+8}$

37) $\dfrac{6x+24}{x^2+7x+1}$

38) $\dfrac{y^2-2y-1}{4} \cdot \dfrac{8}{y+3}$

39) $\dfrac{5n+15}{4n+8} \cdot \dfrac{2n+4}{3n+9}$

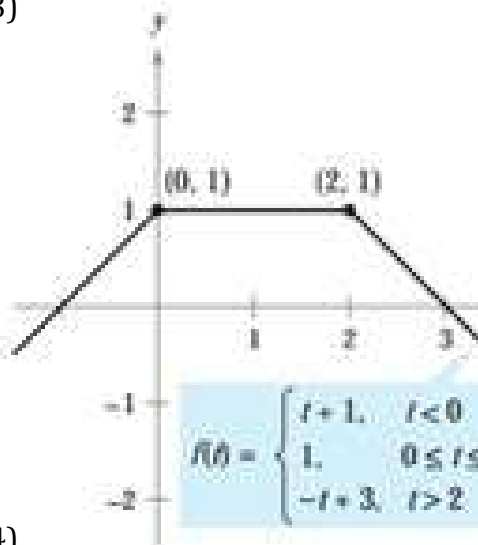40) $\dfrac{x^2-2x}{6} \div \dfrac{3x-6}{x}$

41) $\dfrac{m^2-2m-8+15}{8m+24} \div \dfrac{2m-8}{m^2+7m+1}$

42) $\dfrac{x^2-x-12}{x-4} \div \dfrac{2x+6}{x-5}$

Directions for 43-45: Given the following graphs determine domain and range and where the functions are increasing, decreasing or constant. Use N/A for properties that do not apply. Also use the graph to evaluate the function.

43)

$$f(t) = \begin{cases} t+1, & t<0 \\ 1, & 0 \le t \le \\ -t+3, & t>2 \end{cases}$$

Domain:_____ Range:_____

Increasing:_____ Decreasing:_____

Constant:_____

Maximum:_____ Minimum:_____

X intercept:_____ Y intercept_____

f(0):_____ For what values of x is f(x)=0?_____

44)

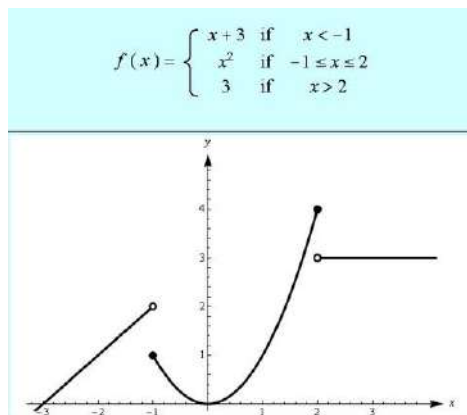$f(x) = x^2 - 3$

Domain:_____ Range:_____

Increasing:_____ Decreasing:_____

Constant:_____

Maximum:_____ Minimum:_____

X intercept:_____ Y intercept_____

f(1):_____ For what values of x is f(x)=2?_____

45)

$$f(x) = \begin{cases} x+3 & \text{if } x<-1 \\ x^2 & \text{if } -1 \le x \le 2 \\ 3 & \text{if } x>2 \end{cases}$$

Domain:_____ Range:_____

Increasing:_____ Decreasing:_____

Constant:_____

Maximum:_____ Minimum:_____

X intercept:_____ Y intercept_____

f(-1):_____ For what value(s) of x is f(x)=4?_____

Directions: Evaluate each for the function $f(x) = x^2 - 2x + 1.$

46) $f(-1)$

47) $f(4)$

48) $f(x + 1)$

49) $f(x - 2)$

50) $f(2x^2)$