Summer
Math Exercises

For students who
are entering

Algebra 2

Cherokee Christian
SCHOOLS

It has been discovered that idle students lose learning over the summer months. To help you succeed next fall—and perhaps to help you learn some lessons that you did not learn the first time through—we have prepared the following packet of math exercises to be completed over the summer. It is clear that most students do not want to spend their entire summer doing math work. Based on how fast or slow you work, you may find that you only need to do math a few days a week. Working on this packet will be most effective if you do work throughout the summer so try not to skip weeks. You may use the following chart to get an idea of how often you might need to work problems:

			Into Alg 2
		Problems:	190
Min/Day	Min/Prob	Prob/Day	Sessions
60	2	30	6
60	3	20	10
60	5	12	16
45	2	22.5	8
45	3	15	13
45	5	9	21
30	2	15	13
30	3	10	19
30	5	6	32

For example, if you work on math for 60 minutes per session and took 2 minutes per problem, you could complete 30 problems a day. That would equate to only about 6 sessions of working math problems over the summer. At the other end of the spectrum, if you want to work only 30 minutes each time and took on average 5 minutes to complete each problem, you would only get 6 problems done during a session and would have to do about 32 sessions to complete the work (i.e., math work about every other day during the summer break). Note that students who learned the material previously should not take more than an average of 5 minutes to work a problem.

This work is MANDATORY for CCS students. Please follow these guidelines:

- Complete the problems assigned on the next page.
- Bring the answers with work to the **first day of classes** so you will get credit.
- Use PENCIL and **write legibly**.
- Do not write work or answers in the packet—use **separate paper**. Either do work on one set of pages and write all answers on a different answer page or do work and mark your answers clearly. Make sure to number the problems.
- Use **graph paper** for the graphing problems.

Assignment for students entering Algebra 2

Assessment	Problems	No of Probs
1	1-42 all	42
2	1-31, 35	32
3	1-38 all	38
4	1-39 all	39
5	1-40 all	40
		191

TOPIC 1

NAME _____ DATE _____

Assessment

For use with Topic 1: Numerical Expressions

Evaluate the expression.

1. $-6 - 4$

2. $16 + (-6)$

3. $(-5)(-8)$

4. $18 \div (-3)$

5. $(16)(-4)(2)$

6. $15 - (-15)$

7. $(9 - 5) \div 2$

8. $4^2 \div 8 - (7 + 4)$

9. $\dfrac{15 \cdot 6}{6^2 \div 2}$

Evaluate the expression.

10. $\dfrac{18}{25} - \dfrac{3}{25}$

11. $\dfrac{7}{12} + \dfrac{11}{18}$

12. $26 - 15.263$

13. $3\dfrac{3}{4} + \dfrac{9}{16}$

14. $36.5007 + 23.01$

15. $-\dfrac{5}{8} \cdot \dfrac{2}{3}$

16. $(-13.2)(2.33)$

17. $\dfrac{13}{24} \div \left(-\dfrac{6}{39}\right)$

18. $20.784 \div 8.66$

Evaluate the expression.

19. $\sqrt{0}$

20. $\pm\sqrt{49}$

21. $-\sqrt{1}$

22. $\sqrt{-16}$

23. $\sqrt{25} + 2\sqrt{4}$

24. $\pm\sqrt{100}$

Approximate the square root.

25. $\sqrt{38}$

26. $-\sqrt{17}$

27. $\sqrt{44}$

28. $\sqrt{95}$

29. $\sqrt{156}$

30. $-\sqrt{236}$

Simplify the expression.

31. $\sqrt{20}$

32. $\sqrt{66}$

33. $\dfrac{1}{5}\sqrt{50}$

34. $4\sqrt{8} \cdot 2\sqrt{8}$

35. $\dfrac{\sqrt{12}}{\sqrt{16}}$

36. $\sqrt{\dfrac{3}{9}}$

37. $4\sqrt{3} - 7\sqrt{3}$

38. $13\sqrt{50} - 9\sqrt{32}$

39. $8\sqrt{2} + 2\sqrt{18}$

40. $-\sqrt{14} \cdot \dfrac{\sqrt{21}}{\sqrt{49}}$

41. $-\sqrt{\dfrac{5}{12}}$

42. $\dfrac{\sqrt{18}}{2} + \dfrac{3}{\sqrt{2}}$

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TOPIC 2

NAME _____ DATE _____

Assessment

For use with Topic 2: Algebraic Expressions

Evaluate the expression when $x = -2$, $y = 3$, and $z = -1$.

1. $2(x - y)^2$ **2.** $\frac{3y^2}{z}$ **3.** $0.4z(2y + x)$ **4.** $\left(\frac{x + z}{y}\right)^{-2}$

Simplify the expression.

5. $4x^2 + 2 - x^2$ **6.** $5(2x - 4) + 3(-3x + 7)$

7. $(-x^2 + x + 2) + (3x^2 + 4x + 5)$ **8.** $(x^2 + 3x - 1) - (4x^2 - 5x + 6)$

9. $(x^3 + 5x^2 - 4x) - (3x^2 - 6x + 2)$ **10.** $(4x^3 + x^2 - 1) + (2 - x - x^2)$

Simplify the expression, if possible. Write your answer as a power.

11. $2^3 \cdot 2^6$ **12.** $(5^3)^2$ **13.** $(3a)^3 \cdot (2a)^2$ **14.** $(w^4x^4y)^2 \cdot (wx^3y^3)^2$

Evaluate the expression. Write your answer as a fraction in simplest form.

15. 5^{-1} **16.** $6^{-2} \cdot 6^{-5}$ **17.** $4\left(\frac{1}{2}\right)^{-1}$ **18.** $(-5)^0 \cdot \left(\frac{1}{3^{-2}}\right)$

19. $\frac{4^3}{4^2}$ **20.** $\frac{7^2}{7^{-1}}$ **21.** $\left(-\frac{2}{3}\right)^2$ **22.** $\left(\frac{7}{5}\right)^{-1}$

Simplify the expression. The simplified expression should have no negative exponents.

23. $\frac{x^{10}}{x^3}$ **24.** $\left(\frac{y^7}{y^2}\right)^4$ **25.** $\frac{(z^3)^5}{(z^3)^7}$ **26.** $\left(\frac{-12a^3b}{4ab}\right)^4$

27. $\left(\frac{16a^5b^3}{-4a^3b^2}\right)^2$ **28.** $\frac{32a^4b^{-2}}{2a^3b^3} \cdot \frac{3a^2b^7}{-2a}$ **29.** $\frac{9x^{-3}y^6}{x^4y^{-5}} \cdot \frac{(3x^2y)^{-2}}{xy^3}$

Find the product.

30. $(-x)(8x^3 - 12x^2)$ **31.** $4x^3(-x^2 + 2x - 7)$

Rewrite the number in scientific notation.

32. 436,000,000 **33.** 0.00638 **34.** 0.000000025

35. ***Geometry*** The volume of a cube is given by $V = s^3$, where s is the length of a side. The cube has a side of length $4a$. What is the volume of the cube if $a = 2$?

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Assessment

For use with Topic 3: Equations and Inequalities

Solve the equation.

1. $x + 5 = 14$ **2.** $y - 10 = -2$ **3.** $8 + m = -6$

4. $49 = -7x$ **5.** $\frac{t}{3} = 15$ **6.** $3x - 11 = -14$

7. $5 + \frac{a}{9} = 10$ **8.** $-8x + 12 = -2 - 8x$ **9.** $7 - (x + 9) = 3x - 6$

10. $2(x - 10) = 2x - 20$ **11.** $-\frac{1}{2}(4x - 6) = 3(2x - 3)$ **12.** $5(2x + 3) = -3(-3x + 4)$

Solve the inequality.

13. $n + 7 < -2$ **14.** $4 > x - 12$ **15.** $0 \leq -8 - x$

16. $\frac{y}{2} \geq -9$ **17.** $-16x > -48$ **18.** $15 - y \leq 19$

19. $6 - 2x < -24$ **20.** $\frac{1}{3}n \geq -\frac{1}{6}n + 4$ **21.** $-3(2x - 3) > -8x + 1$

22. $\frac{2}{3}x - 1 < 3\left(\frac{5}{6}x + 7\right)$ **23.** $3x - (3 - 5x) \leq -2(x - 1)$ **24.** $-(4x + 13) > 11 - 2(3x + 12)$

Solve the equation or inequality if possible.

25. $4x^2 = 16$ **26.** $-180 = -5x^2$ **27.** $\frac{2}{3}y^2 = 150$

28. $|x| = -7$ **29.** $|y| < 12$ **30.** $0 > |n|$

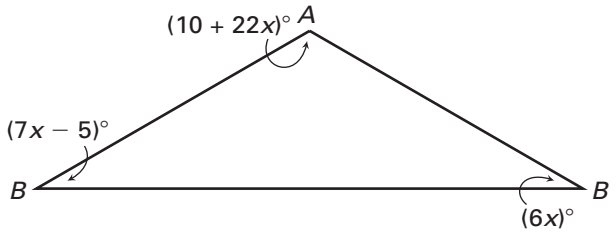
Solve the proportion.

31. $\frac{2}{x} = \frac{5}{15}$ **32.** $\frac{3}{9} = \frac{x}{12}$ **33.** $\frac{-4}{2x} = \frac{3}{21}$

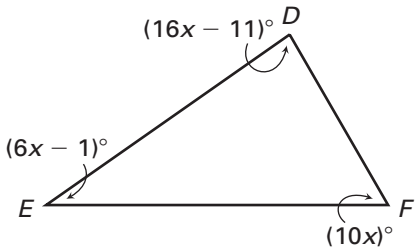
34. $\frac{-21 + x}{45} = \frac{x}{18}$ **35.** $\frac{6}{x + 5} = \frac{4}{2x - 2}$ **36.** $\frac{2x + 5}{4} = \frac{x + 10}{12}$

Find the measure of each angle in the triangle.

37.



38.



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TOPIC 4

NAME _____ DATE _____

Assessment

For use with Topic 4: Graphing Equations

Plot and label the ordered pair in a coordinate plane.

1. $A(4, 6)$ **2.** $B(0, -5)$ **3.** $C(-2, -4)$

4. $D(7, 0)$ **5.** $E(-6, 3)$ **6.** $F(8, -8)$

Without plotting the point, tell whether it is in Quadrant 1, Quadrant 2, Quadrant 3, or Quadrant 4.

7. $(4, 5)$ **8.** $(-7, 2)$ **9.** $(1, -1)$

10. $(-5, -3)$ **11.** $(6, -6)$ **12.** $(-2, 8)$

Find the slope and *y*-intercept of the graph of the equation.

13. $y = 3x + 8$ **14.** $y = -2x - 5$ **15.** $y - 4x = 13$

16. $y = -1$ **17.** $3y + 6x = -12$ **18.** $y = \frac{1}{2}x - \frac{4}{9}$

Graph the equation.

19. $y = -x - 2$ **20.** $x - 4y = 12$ **21.** $-x + 6y = -24$

22. $y = 4$ **23.** $y = 5 - x$ **24.** $x + y = 3$

Find the *x*-intercept and the *y*-intercept of the graph of the equation.

25. $x + y = 7$ **26.** $-2x + 4y = 8$ **27.** $9x - 3y = -27$

Find the *x*-intercept and the *y*-intercept of the line. Graph the equation. Label the points where the line crosses the axes.

28. $-x + 4y = 8$ **29.** $3x + 5y = 15$ **30.** $4x - 5y = -20$

31. $-7x - y = -49$ **32.** $x + 6y = -36$ **33.** $6x - 2y = 18$

Sketch the graph of the function. Label the vertex.

34. $y = x^2 - x - 5$ **35.** $y = -x^2 - 3x + 2$ **36.** $y = -4x^2 + 6x + 3$

37. $y = -x^2 - 2x + 3$ **38.** $y = 2x^2 + 5x + 3$ **39.** $y = 6x^2 + 12x$

Sketch the graph of the absolute value function.

40. $y = |x + 2|$ **41.** $y = 2|x| - 5$ **42.** $y = -3|2x + 1| - 6$

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Assessment

For use with Topic 5: Factoring

Find the greatest common factor and factor it out of the expression.

1. $20x^5 - 55x^2$ **2.** $12x + 8x^4$ **3.** $4x^3 - 36x^7$

4. $18x^2y + 30x^2y^5$ **5.** $-7x^3y^3 + 28xy^2$ **6.** $27x^3y + 9x^2y^3 - 63x^4y^3$

Choose the correct factorization. If neither is correct, find the correct factorization.

7. $x^2 - 2x - 35$
A. $(x - 7)(x + 5)$
B. $(x + 7)(x - 5)$

8. $x^2 - 14x + 48$
A. $(x + 8)(x + 6)$
B. $(x - 4)(x - 12)$

9. $-2x^2 - 14x - 24$
A. $2(x - 4)(x - 3)$
B. $-2(x + 4)(x + 3)$

10. $6x^2 - 7x - 5$
A. $(6x - 5)(x + 1)$
B. $(3x - 5)(2x + 1)$

11. $5x^2 - 28x + 15$
A. $(5x + 3)(x + 5)$
B. $(5x - 3)(x - 5)$

12. $16x^2 - 52x - 14$
A. $2(8x - 7)(x + 2)$
B. $-2(4x + 1)(2x + 7)$

Factor the trinomial.

13. $x^2 + 5x - 14$ **14.** $x^2 - 15x + 56$ **15.** $x^2 + 15x + 50$

16. $x^2 - 8x - 33$ **17.** $x^2 + 5x - 36$ **18.** $x^2 - 10x + 9$

19. $2x^2 + 26x + 80$ **20.** $-3x^2 - 6x + 72$ **21.** $4x^2 - 24x - 64$

Factor the trinomial.

22. $2x^2 + 19x + 42$ **23.** $6x^2 - 13x + 6$ **24.** $6x^2 + 7x - 10$

25. $7x^2 - 31x - 20$ **26.** $3x^2 - 36x + 81$ **27.** $4x^2 + 3x - 10$

28. $12x^2 + 28x + 15$ **29.** $12x^2 + 100x - 72$ **30.** $16x^2 + 80x + 84$

Factor the expression. Tell which special product factoring pattern you used.

31. $4 - 9x^2$ **32.** $4x^2 + 20x + 25$ **33.** $9x^2 - 54x + 81$

34. $169 - 64x^2$ **35.** $81x^2 - 100y^2$ **36.** $75x^2 - 30x + 3$

Factor the expression completely.

37. $2x^3 - 10x^2 - 12x$ **38.** $5x^3 + 30x^2 + 40x$

39. $-12x^4 + 3x^2$ **40.** $9x^3 + 36x^2 - x - 4$

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