

CALVERT



SCHOOL

Rising 8th Grade
Summer Work

Name _____

This summer math review packet contains work for students entering Algebra 2. It includes basic Pre-Algebra and Algebra skills. It also contains an Advanced Algebra Readiness Assessment with an answer key. This will help you to assess how ready you are for Algebra 2.

Bring this packet with you to the first class in the fall. Remember, this work reviews math concepts learned during the past school year. It is designed to give you a head start when school resumes in the fall.

Have a great summer!

Sincerely,

Mr. Little

Advanced Algebra Readiness Assessment

Answer all questions on the provided answer sheet.

Evaluate.

1. $12 \div 2 - 4 \cdot 7$

2. $-8 + 3(1 - 5)^2$

Simplify.

3. $18a + 7a - 9a + 11$

4. $6(n^2 - n) - 5n^2 + 8n$

Solve for x.

5. $9x - 3 = -75$

6. $\frac{5}{8}x - 9 = 21$

7. $4(2x - 1) = -20$

8. $|2x - 5| = 3$

9. $2(x + 3) = 5x + 15$

10. $2x + 2(2x - 3) = -3$

Solve the following formulas for the given variable.

11. Solve for h : $V = \pi r^2 h$

12. Solve for h : $A = \frac{1}{2}(b_1 + b_2)h$

Graph in a coordinate plane.

13. $y = -2x + 5$

Tell whether the lines are parallel, perpendicular, or neither.

14. Line 1: Through points (0,7) and (3,6)

Line 2: Through points (-2,-9) and (0,-3)

Factor the quadratic equations.

15. $x^2 + x$

16. $x^2 + 4x + 4$

Solve the linear system. Use any method.

17.
$$\begin{cases} x + y = 5 \\ x - 5y = -7 \end{cases}$$

18.
$$\begin{cases} x - 2y = 3 \\ x + 5 = 2y \end{cases}$$

Solve each inequality.

19. $2x - 5 \geq 3$

20. $4 - 3p > 16 - p$

Simplify the expressions.

21. $(3x)^2 - 1 + 2x + 3x^2$

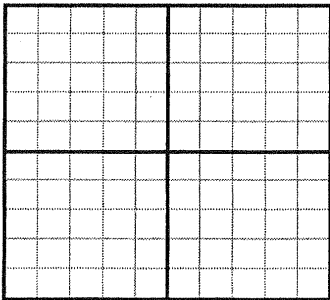
22. $(3x + 5)(2x - 6)$

23. $(2x + 5)(x^2 + 3x - 6)$

24. $\frac{5x^2y}{2xy^3} \cdot \frac{6x^3y^2}{10y}$

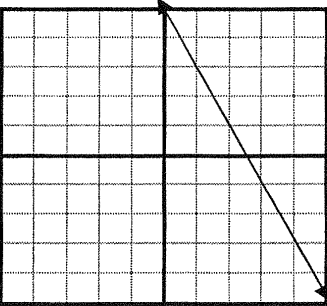
Advanced Algebra Readiness Assessment

Answer Sheet

1.	2.	3.
4.	5.	6.
7.	8.	9.
10.	11.	12.
13. 	14.	15.
16.	17.	18.
19.	20.	21.
22.	23.	24.

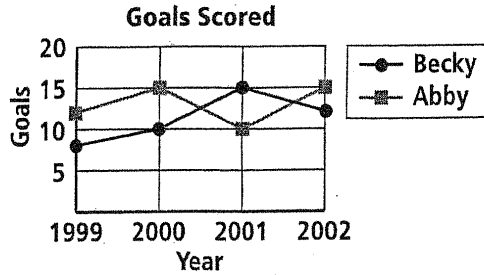
Advanced Algebra Readiness Assessment

Answer Key

1. -22	2. 40	3. $16a + 11$
4. $n^2 + 2n$	5. $x = -8$	6. $x = 48$
7. $x = -2$	8. $x = 4, x = 1$ <i>must have both answers</i>	9. $x = -3$
10. $x = \frac{1}{2}$ or 0.5	11. $h = \frac{v}{\pi r^2}$	12. $\frac{2A}{b_1 + b_2}$ or $\frac{A}{\frac{1}{2}(b_1 + b_2)}$
13.  Slope = -2 y-intercept = 5 Sample points on line are (0,5) (1,3) (2,1) (3,-1)	14. Lines are perpendicular. <i>Line 1 has a slope of -1/3 and Line 2 has a slope of 3.</i>	15. $x(x + 1)$
16. $(x + 2)(x + 2)$ or $(x + 2)^2$	17. $x = 3, y = 2$ (3, 2)	18. No solution <i>Lines are parallel.</i>
19. $x \geq 4$	20. $p < -6$	21. $12x^2 + 2x - 1$
22. $6x^2 - 8x - 30$	23. $2x^3 + 11x^2 + 3x - 30$	24. $\frac{3x^4}{2y}$

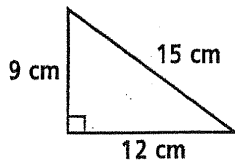
Beginning-of-Course Diagnostic Test

- The line graph shows the number of goals scored each year by Becky and Abby over their high school soccer careers. In which year did Becky and Abby together score the most goals?



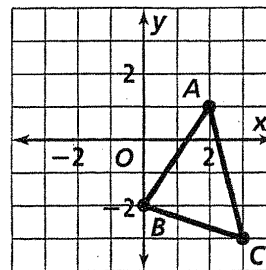
- Estimate the sum of \$14.30, \$143.08, and \$19.74 by rounding.
- Divide $\frac{2}{5} \div \frac{1}{8}$. Write the answer in simplest form.
- Paul, Steve, Robin, and Ryan all play different instruments. Their instruments are guitar, bass guitar, piano, and drums. Robin's instrument is not a string instrument. Paul does not play bass guitar or piano. Ryan's instrument has only four strings. Which instrument does each play?

- Find the perimeter.



- Write five equivalent fractions for $\frac{7}{8}$.
- Find three consecutive even integers whose sum is 180.

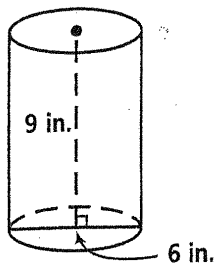
- Use a factor tree to write the prime factorization of 430.
- Write 3.04 as a percent.
- This week Lera withdrew \$150 from her checking account. She wrote a check for \$275, made a deposit of \$200, and then wrote another check for \$75. She now has \$185 in her account. How much did Lera have in her account at the beginning of the week?
- Find the GCF of 15 and 27.
- Write 3.1818... as a fraction in simplest form.
- Find a four digit number that is divisible by 3, 5, and 8.
- Graph the image of $\triangle ABC$ after a translation of 3 units left and 2 units up.



- Subtract $6\frac{3}{4} - 4\frac{11}{12}$. Write the answer in simplest form.
- Troy is writing a book of short stories. It is his goal to write one short story this month, two short stories next month, three short stories the following month, and so on for 13 more months. How many stories will he have written at the end of sixteen months?

Beginning-of-Course Diagnostic Test (continued)

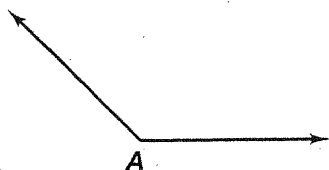
17. Find the volume of the following figure.



18. Find the LCM of 15 and 27.

19. Graph the triangle with vertices $A(-1, 3)$, $B(-3, -2)$, $C(0, -1)$. Then graph its image after a reflection over the y -axis.

20. Use a protractor to measure the angle and classify it as *acute*, *right*, *obtuse*, or *straight*.



21. Multiply $4\frac{2}{3} \cdot 5\frac{1}{6}$. Write the answer in simplest form.

22. Draw a line plot for the frequency table.

Number	8	9	10	11	12
Frequency	3	4	6	2	1

23. When seating guests at a round table, two arrangements are considered the same if each person has the same neighbor to the left and to the right in each arrangement. Find the number of unique arrangements when seating 2, 3, and 4 guests at a round table. Use these results and the fact that 24 unique arrangements are possible when seating 5 guests to find the number of unique arrangements when seating 6 guests.

24. Write 3624 in expanded form using exponents.

25. There are 20 guests at a party. If each person shakes hands with every other person exactly once, how many total handshakes will occur?

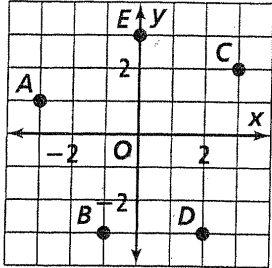
26. Below are the number of hours Grace spent reading during each week of her summer vacation. Make a box-and-whisker plot. Determine the median and mean number of hours Grace spent reading each week.

14 11 18 10 15 14 20 12 13 10 17

27. Write $6^2 \cdot 3^3$ in standard form.

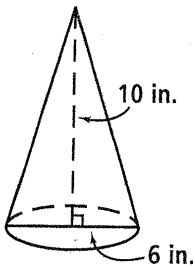
Beginning-of-Course Diagnostic Test

1. Write the coordinate of each point in the graph and name the quadrant or axis where each point lies.



2. Add $6\frac{3}{5} + 2\frac{1}{8}$.
3. Simplify $6 - (-2)(4) + 3(-2)^2$.
4. Mika hiked 4 mi in 77 min. Use a proportion to find how many miles she will hike in 2 h if she hikes at the same rate.

5. Find the volume of the figure.



6. Find the midpoint of the segment with the endpoints $(-3, 4)$ and $(2, -6)$.

7. Display the data from the table in a circle graph.

**U.S. Greenhouse Gas Emissions
From Human Activities, 1999**

Gas and Source	Emissions (teragrams of carbon dioxide equivalents)
Carbon dioxide (CO ₂)	5558.1
Methane (CH ₄)	619.6
Nitrous Oxide (N ₂ O)	432.6
Hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF ₆)	135.7

Source: *The World Almanac and Book of Facts, 2002*

8. Simplify $\frac{(3r^{-1}s^2t^3)^2}{27r^3st^{-2}}$. Use only positive exponents.
9. Simplify $\frac{x^3y^{-3}z^{-1}}{x^{-2}yz^2}$. Use only positive exponents.
10. Simplify $\sqrt{20} + \sqrt{80} - \sqrt{5}$.
11. Simplify $-\sqrt{\frac{4}{7}}$.
12. The highest wind speed recorded, as of the year 2000, on the top of Mount Washington was 231 mi/h, which is about 298% faster than the highest wind speed recorded in Chicago. What was the highest wind speed recorded in Chicago as of the year 2000?

Source: *The World Almanac and Book of Facts, 2002*

Beginning-of-Course Diagnostic Test (continued)
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13. Divide $4\frac{3}{4} \div 2\frac{1}{3}$.
14. Solve $3y - 2 > 5y$. Graph the solution.
15. Divide $\frac{x^4}{4} \div \frac{x^3}{20}$.
16. Alisha ran a total of 32 mi during three days of training for a marathon. On the second day of her training session, she ran 6 mi less than on the first day and 2 mi less than on the third day. How many miles did she run on the first day?
17. Write the product $(2.45 \times 10^3)(1.8 \times 10^5)$ in scientific notation. Round to the appropriate number of significant digits.
18. Let $\triangle ABC$ be an equilateral triangle with side length s . Estimate the percent by which the area of the circle circumscribed about $\triangle ABC$ exceeds the area of the triangle. Recall that the distance from the circumcenter of the triangle to a vertex is equal to the length of the radius of circumscribed circle.
19. Solve $|4t - 3| = 6$.
20. Factor $2x^2 - 5x - 12$.
21. Graph $2x + 4y < 1$.
22. Find the distance between $(-3, -2)$ and $(1, 7)$. Round to the nearest tenth.
23. The vertices of $\triangle ABC$ are $A(-1, 2)$, $B(0, 3)$, and $C(3, 1)$. Determine the vertices A' , B' , and C' of the image of $\triangle ABC$ after a reflection in the x -axis.
24. How many ways can you roll two standard number cubes and get a sum of 9?
25. The formula $k = \frac{1}{2}mv^2$ relates the kinetic energy of a body to its mass m and speed v . Solve the formula for m .
26. Find the mean, median, and mode of the following data set.
-1 -1 0 2 2 3 3 4 7 7 7
27. Find the area of a triangle with a base of 14 in. and a height of 6 in.