

Students entering 9th grade Math Standard:

In order to keep our current math skills sharp, please complete this summer review packet. Use your previous class notes and work, websites such as Khan Academy and IXL and other math reference books for guides. Please complete before the first day of school in August 2020. You will be tested on this material when you return to school. If there are topics you are struggling with, please use the extra resources provided to practice!

Show all work, graphs and solutions clearly on a **separate** sheet of paper. Your work should be numbered and organized so it is easy to read. Solutions are not provided with this packet.

Have a good summer!

CDS Mathematics Department

Formulas:

Quadratic Formula	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
Pythagorean Theorem	$c^2 = a^2 + b^2$
Midpoint, Distance, Slope	$\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right), d = \sqrt{(x_2-x_1)^2 + (y_2-y_1)^2}, m = \frac{y_2-y_1}{x_2-x_1}$
Equation of line	$y = mx + b$ $Ax + By = C$, where $A, B, C \in \mathbb{Z}$ and $A > 0$
Area of a Triangle	$A = \frac{1}{2}bh$

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Simplifying Expressions

Topic	Extra Help	Extra Practice (IXL)
Simplifying polynomials	https://www.khanacademy.org/math/algebra/introduction-to-polynomial-expressions/multiplying-binomials-2/v/multiplying-binomials https://www.khanacademy.org/math/algebra/introduction-to-polynomial-expressions/multiplying-polynomials-by-binomials/v/more-multiplying-polynomials	Algebra 1 Z.4, Z.8, Z.9
Index Laws (Exponents)	https://www.khanacademy.org/math/algebra2/exponential-growth-and-decay-alg-2/equivalent-forms-of-exponential-expressions/v/simplifying-an-exponential-expression	Algebra 1 V.3, V.4, V.5, V.6, V.7, V.8
Radical Operations	https://www.khanacademy.org/math/algebra-home/alg-exp-and-log/miscellaneous-radicals/v/adding-and-simplifying-radicals https://www.khanacademy.org/math/algebra-home/alg-exp-and-log/miscellaneous-radicals/v/multiply-and-simplify-a-radical-expression-2	Algebra 1 EE.4, EE.5, EE.6, EE.7

Solving Equations:

Topic	Extra Help	Extra Practice IXL
Solving Linear Equations	https://www.khanacademy.org/math/algebra-home/alg-basic-eq-ineq/alg-old-school-equations/v/algebra-linear-equations-1	Algebra 1 J.5, J.6, J.11
Systems of Equations	https://www.khanacademy.org/math/algebra/systems-of-linear-equations	Algebra1 U.2, U.8, U.10, U.14

Equations of Lines and Graphing:

Topic	Extra Help	Extra Practice IXL
Equations of lines	https://www.khanacademy.org/math/algebra/x2f8bb11595b61c86:forms-of-linear-equations/x2f8bb11595b61c86:writing-slope-intercept-equations/v/equation-of-a-line-3	Algebra 1 S.9
Graphing lines	https://www.khanacademy.org/math/algebra/x2f8bb11595b61c86:forms-of-linear-equations/x2f8bb11595b61c86:standard-form/v/plotting-x-y-relationships	Algebra1 S.8

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1) Simplify: $\frac{x^4 y^3 z^{-3}}{x^2 y^2 z^4}$

12) Which property is represented by:
 $4(6 * 3) = (4 * 6) * 3$

2) Solve by elimination:

$$\begin{aligned} 4x - 5y &= 8 \\ 3x - 4y &= 12 \end{aligned}$$

13) Simplify: $(6xy^5) \div (9x^2y^5)$

3) Simplify:

$$5x^3 + x^2 - x - 1 - (x^2 + x + 3)$$

14) Simplify: $2 - 3(x+5) + 5x$

4) Simplify $2x^2 - 8x^2 + 5x - 3x + 10 - 12$

15) Solve: $\frac{x+3}{44} = \frac{42}{33}$

5) Multiply: $(3x + 1)(2x - 4)$

16) Simplify: $(2x^6)^{-1}$

6) Create any line perpendicular to: $y = \frac{-5}{3}x + 3$

17) Simplify: $(3a^5b)(5a^2b^2)(4a^4)$

7) Simplify: $\sqrt{75} + \sqrt{12}$

18) Jose has **16** coins that total **\$1.80**. If he has only **nickels and quarters**, how many quarters does he have?

8) Find $\sqrt{\frac{169}{400}}$

9) Solve for x: $3x - 4 < 17$?

19) Nick worked **16 hours** last week. He earned **\$5 per hour** at a local bakery and **\$5.50 per hour** at a fast food restaurant. If he earned a total of **\$82**, how many **hours** did he work at the **bakery**?

10) Find $f(-5)$ when $f(x) = -x^2 - 2x$

20) Graph $3x + 4y \leq 8$ by shading above or below the line.

11) Solve by graphing:

$$\begin{aligned} y &= 2x + 5 \\ y &= -x + 8 \end{aligned}$$

21) Translate the following sentence into an equation. **The product of eight and four less than n is 36.**

22) Simplify: $12(\frac{3}{4}x + \frac{1}{3}) - \frac{1}{2}(12x - 6)$

23) Find the GCF: $4x^3 - 6x^2$
(greatest common factor)

24) Simplify: $-\sqrt{5} + 3\sqrt{5} - 6\sqrt{3}$

25) Simplify $\sqrt{8}(\sqrt{10})$

26) Simplify: $\frac{6}{\sqrt{3}}$

27) Expand and simplify: $(2x-1)^2$

28) Find the slope and y-intercept of the line whose equation is: $y = -2x - 3$

29) Simplify: $3r + 7(r-4)$

30) Evaluate: $\frac{a+15b}{c}$ if $a = -9, b = 9, c = -3, d = 2$

31) Evaluate $2x^2 - 7x + 1$ if $x = -3$

32) Solve for b in the equation $c + by = a$.

33) Solve: $3x - 2.5x = 7x - 10$

34) Find the slope of a line passing through the following points: **(3, -5) and (-6, 13)**

35) Solve by substitution:

$$\begin{aligned}y &= 2x - 1 \\ -6x + 5y &= 3\end{aligned}$$

36) Find an equation of a line with slope 5 and passing through the point $(-1, 2)$

37) Simplify using exponents: $a^*a^*r^*d^*v^*a^*r^*k$

38) Solve: $\frac{x}{4} - \frac{x+4}{5} = 1$

39) Solve:

$$\begin{aligned}2x + y &= -6 \\ 3x - 2y &= -2\end{aligned}$$

40) Find the **constant of variation** if **y varies directly as x** and **y = 19** when **x = 95**.

41) Three pens and two notebooks cost \$8.25. Two pens and three notebooks cost \$8.00. How much are two pens and two notebooks?

42) Solve: $b - 3b = 24$

OPTIONAL PROBLEMS: #43-46

43)

What is the value of $2 - (-2)^{-2}$?

- (A) -2 (B) $\frac{1}{16}$ (C) $\frac{7}{4}$ (D) $\frac{9}{4}$ (E) 6

44)

Marie does three equally time-consuming tasks in a row without taking breaks. She begins the first task at 1:00 PM and finishes the second task at 2:40 PM. When does she finish the third task?

- (A) 3:10 PM (B) 3:30 PM (C) 4:00 PM (D) 4:10 PM (E) 4:30 PM

45)

Four siblings ordered an extra large pizza. Alex ate $\frac{1}{5}$, Beth $\frac{1}{3}$, and Cyril $\frac{1}{4}$ of the pizza. Dan got the leftovers. What is the sequence of the siblings in decreasing order of the part of pizza they consumed?

- (A) Alex, Beth, Cyril, Dan
(B) Beth, Cyril, Alex, Dan
(C) Beth, Cyril, Dan, Alex
(D) Beth, Dan, Cyril, Alex
(E) Dan, Beth, Cyril, Alex

46)

The letter F shown below is rotated 90° clockwise around the origin, then reflected in the y -axis, and then rotated a half turn around the origin. What is the final image?

