

**Directions for completing the Accelerated Algebra 2 Summer  
Algebra Skills Packet  
2018-2019**

Please print out the entire packet and **do not** wait to start completing it! Go through each page and make sure you know how to do each problem. These are the basic Algebra 1 skills that you should have in order to enroll in Accelerated Algebra 2. You should be able to do these calculations without a calculator. Make sure your work is neat and organized for each problem you complete.

As you are working through each problem, make note of any problems you do not understand as well as any questions you may have. I will spend some time each day during the first couple weeks of school answering your questions and addressing your concerns. I will not be collecting your packet. However, your first test is over the contents of this packet.

If you get stuck, you can go to the following sources for help.

<https://www.khanacademy.org/math/algebra> (Sign-up for a free account.)

<http://www.coolmath.com/algebra/04-factoring>

<http://www.algebrahelp.com/>

If you have any questions, you can email me at [rtillman@district70.org](mailto:rtillman@district70.org). I will check my email periodically throughout the summer.

**Topics Included:**

1. Simplifying Radicals
2. Solving Linear Equations
3. Solving Linear Inequalities
4. Variable Manipulation
5. Properties of Exponents
6. Factoring Using Greatest Common Factors
7. Factoring Trinomials when  $a=1$
8. Factoring Trinomials when  $a \neq 1$
9. Graphing lines
10. Writing Equations of Lines from 2 Points in Slope-Intercept Form
11. Writing Equations of Lines From a Point and a Slope in Point-Slope Form
12. Solving Quadratic Equations Using the Quadratic Formula
13. Patterns and Problem Solving

## Simplifying Radicals

Simplify.

1)  $\sqrt{12}$

2)  $\sqrt{36}$

3)  $\sqrt{45}$

4)  $\sqrt{8}$

5)  $\sqrt{48}$

6)  $\sqrt{128}$

7)  $\sqrt{125}$

8)  $4\sqrt{700}$

9)  $5\sqrt{128}$

10)  $-5\sqrt{72}$

11)  $-8\sqrt{162}$

12)  $\sqrt{7} + \sqrt{112}$

13)  $\sqrt{3} + \sqrt{48}$

14)  $\sqrt{24} + \sqrt{6}$

15)  $\sqrt{18} + \sqrt{32}$

16)  $-2\sqrt{2} - 3\sqrt{8}$

17)  $2\sqrt{20} - 3\sqrt{20}$

18)  $2\sqrt{5} - 2\sqrt{45}$

19)  $\sqrt{90} \cdot \sqrt{95}$

20)  $\sqrt{12} \cdot \sqrt{40}$

21)  $\sqrt{45} \cdot \sqrt{27}$

22)  $3\sqrt{6}(3 + \sqrt{6})$

23)  $\sqrt{3}(\sqrt{5} - 3\sqrt{3})$

24)  $\frac{\sqrt{10}}{\sqrt{15}}$

25)  $\frac{\sqrt{3}}{\sqrt{2}}$

26)  $\frac{\sqrt{5}}{\sqrt{3}}$

27)  $\frac{\sqrt{15}}{\sqrt{6}}$

## Solutions of Equations

Name \_\_\_\_\_

Date \_\_\_\_\_ Period \_\_\_\_\_

Solve.

- |                               |          |                              |       |
|-------------------------------|----------|------------------------------|-------|
| 1. $3x = 4x - 7$              | <u>7</u> | 2. $5x = 9x - 16$            | _____ |
| 3. $7y = 2y - 15$             | _____    | 4. $4y = y - 21$             | _____ |
| 5. $9x = 2x + 14$             | _____    | 6. $8z = 3z + 30$            | _____ |
| 7. $99 + 6u = -3u$            | _____    | 8. $13p + 2p = 29 - 14p$     | _____ |
| 9. $13d + 25 = 8d$            | _____    | 10. $6m - 14 = 2m + 6$       | _____ |
| 11. $7u - 2u = 3u + 22$       | _____    | 12. $9u - 3u = 2u + 24$      | _____ |
| 13. $17p + p = 40 - 2p$       | _____    | 14. $44 + 7p = -4p$          | _____ |
| 15. $2m - 21 = 9m + 7$        | _____    | 16. $15m - 25 = 9m + 17$     | _____ |
| 17. $18n + 12 = 27n + 3$      | _____    | 18. $41n + 18 = 49n + 42$    | _____ |
| 19. $15b - 8 = 31b + 24$      | _____    | 20. $19b - 10 = 35b + 22$    | _____ |
| 21. $3(z + 5) = 8z$           | _____    | 22. $2(z + 7) = 9z$          | _____ |
| 23. $5(4 - 7u) = -u - 48$     | _____    | 24. $6(5 - 3u) = -4u - 12$   | _____ |
| 25. $7(3 - u) + u = 5 - 2u$   | _____    | 26. $4(3 - u) + u = 22 + 2u$ | _____ |
| 27. $5(1 + c) = 6(2 + c)$     | _____    | 28. $9(3 + c) = 4(3 + c)$    | _____ |
| 29. $5(x + 7) = 6(x - 5)$     | _____    | 30. $9(x - 4) = 3(x + 12)$   | _____ |
| 31. $6(2x - 1) = -5(3x - 15)$ | _____    | 32. $8(3x + 1) = 7(2x + 4)$  | _____ |

## Solving Inequalities

Name \_\_\_\_\_

Date \_\_\_\_\_ Period \_\_\_\_\_

Solve.

1.  $4x < 8$
2.  $2x < 8$
3.  $x + 7 > 10$
4.  $x + 20 > -1$
5.  $x - 9 < 12$
6.  $x - 9 < -13$
7.  $4x + 7 < 39$
8.  $3x + 9 < 39$
9.  $9x - 2 \geq 61$
10.  $5x - 4 > 46$
11.  $-x < 9$
12.  $-x < -4$
13.  $5 - x > 13$
14.  $6 - x \leq 19$
15.  $7 - x > 16$
16.  $31 - 12x > 79$
17.  $7x > 28$
18.  $13x > 39$
19.  $x + 11 < 20$
20.  $x + 17 < -10$
21.  $x - 19 > 26$
22.  $x - 21 \geq 19$
23.  $7x + 5 > 82$
24.  $10x + 9 > 29$
25.  $11x - 6 \leq 93$
26.  $15x - 5 < 70$
27.  $-x < 14$
28.  $-x > 14$
29.  $17 - x < 23$
30.  $14 - x < 23$
31.  $14 - 6x > 74$
32.  $12 - 4x \geq 48$

Equations Having More Than One Variable

Name \_\_\_\_\_

Date \_\_\_\_\_ Period \_\_\_\_\_

Solve for  $y$ .

1.  $3x + y = 5$

$y = 5 - 3x$

2.  $2x + y = 7$  \_\_\_\_\_

3.  $8x + 4y = 12$  \_\_\_\_\_

4.  $4x + 2y = 8$  \_\_\_\_\_

5.  $5x - y = 13$  \_\_\_\_\_

6.  $8x - y = 13$  \_\_\_\_\_

7.  $-3x - 4y = 13$  \_\_\_\_\_

8.  $-5x + 3y = 7$  \_\_\_\_\_

9.  $2x + \frac{1}{3}y = 7$  \_\_\_\_\_

10.  $5x + \frac{1}{2}y = 4$  \_\_\_\_\_

11.  $7x - \frac{3}{4}y = 5$  \_\_\_\_\_

12.  $6x - \frac{2}{3}y = 9$  \_\_\_\_\_

13.  $x + \frac{y}{3} = 12$  \_\_\_\_\_

14.  $x + \frac{y}{7} = 10$  \_\_\_\_\_

15.  $5x + \frac{2y}{3} = 4$  \_\_\_\_\_

16.  $7x + \frac{5y}{2} = 9$  \_\_\_\_\_

Solve for the variable specified. Assume domains include only values that give nonzero denominators.

17.  $p = a + b + c$  for  $c$

$c = p - a - b$

18.  $V = LWH$  for  $H$  \_\_\_\_\_

19.  $A = h(b_1 + b_2)$  for  $h$  \_\_\_\_\_

20.  $V = \frac{1}{2}abh$  for  $b$  \_\_\_\_\_

21.  $V = \frac{1}{3}Bh$  for  $B$  \_\_\_\_\_

22.  $V = \frac{4}{3}\pi r^3$  for  $\pi$  \_\_\_\_\_

23.  $p = 4s$  for  $s$  \_\_\_\_\_

24.  $A = \frac{1}{2}d_1 d_2$  for  $d_1$  \_\_\_\_\_

25.  $S = 180(n - 2)$  for  $n$  \_\_\_\_\_

26.  $A = p(1 + rt)$  for  $r$  \_\_\_\_\_

27.  $L = a + d(n - 1)$  for  $d$  \_\_\_\_\_

28.  $S = \frac{n}{2}(a + 1)$  for  $a$  \_\_\_\_\_

29.  $F = \frac{WH}{L}$  for  $H$  \_\_\_\_\_

30.  $K = \frac{IEh}{1000}$  for  $h$  \_\_\_\_\_

# How Does the King's Son Write?

Simplify each expression. For each set of exercises, there is one extra answer. Write the letter of this answer in the corresponding box at the right.



<p><b>1</b></p> <p>a. <math>9x \cdot x^5</math></p> <p>b. <math>5x^2 \cdot 4x^3</math></p> <p>c. <math>(-8x^4)(-3x)</math></p> <p>d. <math>(6x^4)(-x^6)</math></p>	<p>(K) <math>24x^5</math></p> <p>(O) <math>-6x^{10}</math></p> <p>(A) <math>9x^6</math></p> <p>(E) <math>24x^{10}</math></p> <p>(L) <math>20x^5</math></p>
<p><b>2</b></p> <p>a. <math>(7n^3)^2</math></p> <p>b. <math>(-4n^8)^3</math></p> <p>c. <math>(5n^4)^4</math></p> <p>d. <math>(-2n^2)^6</math></p>	<p>(W) <math>64n^{12}</math></p> <p>(I) <math>625n^{12}</math></p> <p>(U) <math>-64n^{24}</math></p> <p>(B) <math>49n^6</math></p> <p>(D) <math>625n^{16}</math></p>
<p><b>3</b></p> <p>a. <math>(4m^7d^2)^2</math></p> <p>b. <math>(-9m^4d^3)^2</math></p> <p>c. <math>(-m^2d^5)^3</math></p> <p>d. <math>(-3md^9)^4</math></p>	<p>(T) <math>16m^{14}d^4</math></p> <p>(G) <math>-m^6d^{15}</math></p> <p>(V) <math>81m^8d^6</math></p> <p>(E) <math>m^6d^8</math></p> <p>(R) <math>81m^4d^{36}</math></p>
<p><b>4</b></p> <p>a. <math>3xy(5x^2y)^2</math></p> <p>b. <math>(-7y)(2xy^2)^3</math></p> <p>c. <math>x^8y^3(-10x^5y^4)^2</math></p> <p>d. <math>(xy^4)^4(-9y^3)</math></p>	<p>(S) <math>-56x^3y^7</math></p> <p>(N) <math>100x^{20}y^7</math></p> <p>(C) <math>75x^5y^3</math></p> <p>(F) <math>-9x^4y^{19}</math></p> <p>(T) <math>100x^{18}y^{11}</math></p>
<p><b>5</b></p> <p>a. <math>(5p^2q^3)(p^5q)(2p^4q)</math></p> <p>b. <math>(2p^5q^2)(9p^3)(-4p^8q)</math></p> <p>c. <math>(-18q^6)(4p^4q)(-pq^3)</math></p> <p>d. <math>3pq(-2q^5)(12p^9q^2)</math></p>	<p>(H) <math>72p^{10}q^{12}</math></p> <p>(B) <math>-72p^{16}q^3</math></p> <p>(G) <math>10p^{11}q^5</math></p> <p>(L) <math>72p^5q^{10}</math></p> <p>(M) <math>-72p^{10}q^8</math></p>
<p><b>6</b></p> <p>a. <math>(8ut^3)^2(u^2t)^2</math></p> <p>b. <math>(u^4t)^3(-2ut^5)^4</math></p> <p>c. <math>(-ut^3)(-ut)^3</math></p> <p>d. <math>(-u^2t)^4(-u^2t^4)</math></p>	<p>(W) <math>-u^{10}t^8</math></p> <p>(T) <math>64u^6t^8</math></p> <p>(F) <math>u^4t^6</math></p> <p>(S) <math>16u^{16}t^{23}</math></p> <p>(R) <math>-u^4t^8</math></p>
<p><b>7</b></p> <p>a. <math>(3ab^2c^5)^3(a^3b^8c)^2</math></p> <p>b. <math>(-bc^5)(a^4b^3c^9)(-ab^8)</math></p> <p>c. <math>(-2ab)^3(ac^3)(11bc^2)</math></p> <p>d. <math>(a^2bc)^5(a^2bc^5)</math></p>	<p>(D) <math>27a^9b^{22}c^{17}</math></p> <p>(C) <math>-88a^4b^3c^6</math></p> <p>(G) <math>a^{12}b^6c^{10}</math></p> <p>(T) <math>-88a^4b^4c^5</math></p> <p>(K) <math>a^5b^{12}c^{14}</math></p>
<p><b>8</b></p> <p>a. <math>(\frac{1}{2}k^8v^3)^2(60kv^4)</math></p> <p>b. <math>(10k^5v)^3(\frac{1}{5}v^3)^2</math></p> <p>c. <math>-(k^9v^2)(-15v^6)</math></p> <p>d. <math>(-kv)^2(-kv)^3(-kv)^4</math></p>	<p>(P) <math>-15k^9v^9</math></p> <p>(T) <math>40k^{15}v^9</math></p> <p>(W) <math>15k^{17}v^{10}</math></p> <p>(B) <math>-k^9v^9</math></p> <p>(S) <math>15k^9v^8</math></p>

Greatest Common Factors

Name \_\_\_\_\_

Date \_\_\_\_\_ Period \_\_\_\_\_

Find the greatest common factor for each pair.

1.  $(4y, 8)$        $4$
2.  $(6x, 9x^2)$
3.  $(25x, 35xy)$
4.  $(16ab, 20b)$
5.  $(35y^5, 15y^3)$
6.  $(16a^2, 80a^5)$
7.  $(12z^2, 48z)$
8.  $(28r^3s^2t, 70r^2s^5t^3)$
9.  $(120x^3y, 45xy^3)$
10.  $(28a^2b^3, 56a^5b^7)$
11.  $(15b^4, 5b^2)$
12.  $(38s^3t^2, 87s^3t^5)$
13.  $(15r^3s, 33a^5b^2)$
14.  $(29mn^2, 58m^3n^5)$
15.  $(45a^{10}b^5c^3, 60a^2b^7c^5)$
16.  $(28a^5b^3, 35a^2b^9)$
17.  $(43rst, 81abc)$
18.  $(19m^3n, 25a^4b)$
19.  $(46p^3q^2r^4, 69p^2q^4r)$
20.  $(42a^5b^2c, 56a^2b^2c^5)$
21.  $(40m^4n^2r, 100m^2n^3r^5)$
22.  $(25mn^4, 35m^3n^2)$
23.  $[3(a - b)^2(a + b), (a + b)^4]$
24.  $(75x^3y^3z^4, 125x^4y^2z^2)$
25.  $[8(r + s)^3, 24(r + s)^2]$
26.  $(55mnp, 61abc)$
27.  $(22m^4n^2, 110mn^6)$
28.  $[6(x + y)^3, 15(x + y)]$
29.  $[12(x - y)(y + z), 25(y + z)]$
30.  $(24a^2z^4, 36a^4z^2)$
31.  $(72x^3y^2z, 40x^2y^4z^3)$
32.  $[13(a + b)^2(a + c), 27(a + c)]$
33.  $(92m^2n^4, 123mn^2)$
34.  $[35(m - n), 40(m - n)(s + t)]$

# Why Was the Deck of Cards Always in Trouble?



Simplify the expression. For each set of exercises, there is one extra answer. Write the letter of this answer in each box containing the number of that set.

<b>1</b>	a. $\frac{20x^5}{5x^3}$	b. $\frac{-28x^4}{7x}$	<b>P</b> $-4x^3$	<b>O</b> $-4x$	<b>V</b> $4x^2$											
<b>2</b>	a. $\frac{26m^8n^2}{13m^5n}$	b. $\frac{-60m^9n^6}{-12mn^2}$	<b>I</b> $5m^3n^2$	<b>A</b> $2m^3n$	<b>G</b> $5m^8n^4$											
<b>3</b>	a. $\frac{2ab^5}{a^4b^2}$	b. $\frac{-5a^2b^3}{10b^8}$	<b>F</b> $\frac{2b^3}{a^3}$	<b>S</b> $\frac{2a^2}{b^3}$	<b>T</b> $-\frac{a^2}{2b^5}$											
<b>4</b>	a. $\frac{(k^2e)^2}{k^3e}$	b. $\frac{(ke)^2(ke^2)}{k^2e}$	<b>N</b> $ke^3$	<b>L</b> $ke$	<b>D</b> $k^2e^2$											
<b>5</b>	a. $\frac{(-3c^3d)^2}{2cd^3}$	b. $\frac{(-c)^3(-a^3)}{5c^8d}$	<b>A</b> $\frac{9c^5}{2d}$	<b>R</b> $\frac{a^2}{5c^5}$	<b>E</b> $\frac{9d}{5c^3}$											
<b>6</b>	a. $\left(\frac{8x}{y^3}\right)^2$	b. $\left(\frac{x^5}{-2y^2}\right)^3$	<b>B</b> $\frac{x^{15}}{8y^6}$	<b>T</b> $\frac{x^8}{8y^8}$	<b>W</b> $\frac{64x^2}{y^6}$											
<b>7</b>	a. $\left(\frac{6ab^3}{3c^2}\right)^2$	b. $\left(\frac{a^2b^3c^4}{ac^2}\right)^3$	<b>R</b> $\frac{4a^3b^9}{c^4}$	<b>N</b> $a^3b^9c^8$	<b>V</b> $\frac{4a^2b^6}{c^4}$											
<b>8</b>	a. $\frac{(-5vt)^2}{-5vt^2}$	b. $\frac{15(v^2t)^5}{3v^{10}}$	<b>H</b> $5vt^4$	<b>L</b> $-5v$	<b>A</b> $5t^5$											
<b>9</b>	a. $\frac{(-3wh^3)^2}{9w^5h^8}$	b. $\frac{-w(-h)^4}{(-wh)^4}$	<b>J</b> $-\frac{1}{w^2h^2}$	<b>F</b> $-\frac{1}{w^3}$	<b>B</b> $\frac{1}{w^3h^2}$											
<b>10</b>	a. $\left(\frac{5pq^3}{4p^3q}\right)^2$	b. $\left(\frac{-3q^5}{pq}\right)^3$	<b>A</b> $\frac{27q^{12}}{p^3}$	<b>L</b> $\frac{27q^6}{p^4}$	<b>N</b> $\frac{25q^4}{16p^4}$											
<b>11</b>	a. $\frac{(-2n)^5}{-2n^5}$	b. $\frac{12n(-n)^3}{-60n^2}$	<b>G</b> $\frac{n^2}{5}$	<b>B</b> $16$	<b>K</b> $\frac{n}{8}$											
<b>12</b>	a. $\left(\frac{a^3}{7b^2}\right)^x$	b. $\left(\frac{7a^x}{7b^y}\right)^x$	<b>P</b> $\frac{a^{3x}}{b^{2x}}$	<b>M</b> $\frac{a^{3x}}{7^x b^{2x}}$	<b>W</b> $\frac{a^{3x}}{7b^x}$											
6	8	5	9	1	11	5	7	3	12	5	7	5	12	2	10	4



## Factoring

Name \_\_\_\_\_

Date \_\_\_\_\_ Period \_\_\_\_\_

Factor.

1.  $2x^2 - 10x$       $2x(x - 5)$

2.  $5x - 20x^2$

3.  $x^2y - 3x^2$

4.  $ab^2 + 4b^2$

5.  $x^2z + y^2z^2$

6.  $c^4d^2 + c^2d^3$

7.  $8x - 16y$

8.  $15a + 25b$

9.  $4a + 20b$

10.  $6m - 12n$

11.  $3x - 6y + 12$

12.  $4a - 8b + 16c$

13.  $5 + 15n + 45m$

14.  $7 + 28a - 35b$

15.  $13a^2 - 169a$

16.  $15a + 225a^3$

17.  $8x - 56x^3$

18.  $3a^2 + 12a^4$

19.  $14u^2 + 35u^4$

20.  $23x^5 - 46x^2$

21.  $u^3 - 3u^2 + 17u^4$

22.  $x^4 - 3x^3 + 17x^2$

23.  $3x^3 + 3x^2 + 6x$

24.  $5a^4 - 5a^2 + 25a$

25.  $x^3 + 3x^2y + 3xy$

26.  $x^4 + 3x^3y^2 + 12x^2y^3$

27.  $4a^4b - 16a^2b^2 + 4ab^4$

28.  $6a^3b^2 - 12a^2b^3 + 18ab$

29.  $15x^2y^2 + 225x^3y^3 + 15x^4y^4$

30.  $13a^3b^2 + 39a^2b - 26ab^4$

31.  $15x^3 + 24x^2 + 36x$

32.  $7c^3 - 28c^2d + 35cd^3$

33.  $a^3y^3 + a^2y^2 + ay$

34.  $mn + 5m^2n^2 - 12m^2n^3$

## Factoring

Name \_\_\_\_\_

Date \_\_\_\_\_ Period \_\_\_\_\_

Factor.

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

2.  $x^2 + 2x - 8$

3.  $x^2 + 3x - 40$

4.  $x^2 + 3x - 54$

5.  $x^2 + 2x - 48$

6.  $x^2 + 3x - 28$

7.  $x^2 + x - 30$

8.  $x^2 + 2x - 15$

9.  $x^2 + 8x - 9$

10.  $x^2 + 5x - 36$

11.  $x^2 + 5x - 24$

12.  $x^2 + 7x - 18$

13.  $x^2 + 5x - 14$

14.  $x^2 + 2x - 35$

15.  $x^2 + 3x - 10$

16.  $x^2 + x - 72$

17.  $x^2 + 7x - 8$

18.  $x^2 + 4x - 12$

19.  $x^2 - 7x - 18$

20.  $x^2 - x - 30$

21.  $x^2 - 3x - 40$

22.  $x^2 - 2x - 48$

23.  $x^2 - 3x - 10$

24.  $x^2 - 2x - 3$

25.  $x^2 - 8x - 9$

26.  $x^2 - 7x - 8$

27.  $x^2 - 5x - 36$

28.  $x^2 - 3x - 54$

29.  $x^2 - 4x - 12$

30.  $x^2 - x - 6$

31.  $x^2 - 2x - 15$

32.  $x^2 - 3x - 28$

33.  $x^2 - x - 72$

34.  $x^2 - 5x - 14$

## Factoring

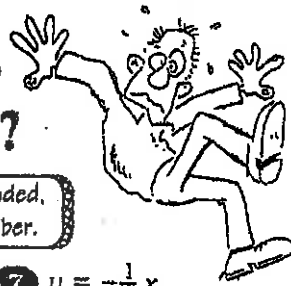
Name \_\_\_\_\_

Date \_\_\_\_\_ Period \_\_\_\_\_

Factor.

1.  $3x^2 + 13x + 12$   **$(3x + 4)(x + 3)$**
2.  $2x^2 + 11x + 14$
3.  $4x^2 + 17x + 15$
4.  $2x^2 + 15x + 28$
5.  $3x^2 + 19x + 28$
6.  $5x^2 + 17x + 6$
7.  $6x^2 + 11x + 5$
8.  $2x^2 + 9x + 10$
9.  $3x^2 + 8x + 4$
10.  $4x^2 + 13x + 10$
11.  $5x^2 + 28x + 15$
12.  $2x^2 + 11x + 9$
13.  $3x^2 + 16x + 21$
14.  $5x^2 + 26x + 5$
15.  $5x^2 + 37x + 42$
16.  $6x^2 + 23x + 15$
17.  $4x^2 + 13x + 3$
18.  $2x^2 + 9x + 9$
19.  $2x^2 + 23x + 63$
20.  $5x^2 + 42x + 16$
21.  $6x^2 + 53x + 40$
22.  $2x^2 + 13x + 20$
23.  $3x^2 - 22x + 24$
24.  $5x^2 - 38x + 21$
25.  $4x^2 - 25x + 25$
26.  $6x^2 - 47x + 35$
27.  $2x^2 - 19x + 42$
28.  $6x^2 - 31x + 28$
29.  $5x^2 - 49x + 36$
30.  $3x^2 - 19x + 20$
31.  $4x^2 - 5x + 1$
32.  $2x^2 - 7x + 5$
33.  $5x^2 - 47x + 18$
34.  $3x^2 - 31x + 36$

# What Happened to the Guy Who Fell Into an Upholstery Machine?

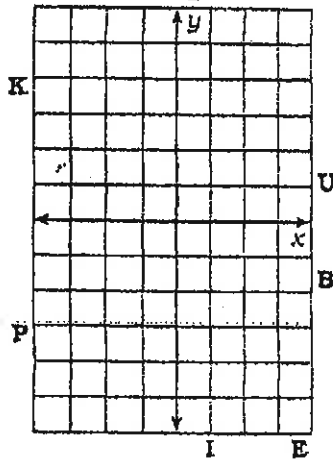


Use the slope and y-intercept to graph each equation. The graph, if extended, will cross a letter. Write this letter in the box containing the exercise number.

1  $y = \frac{3}{4}x - 2$

2  $y = -2x + 1$

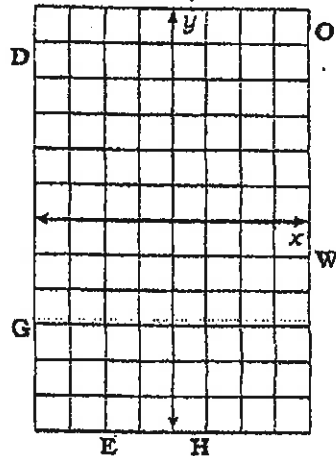
3  $y = -\frac{5}{2}x - 4$



4  $y = \frac{1}{3}x + 4$

5  $y = 3x - 1$

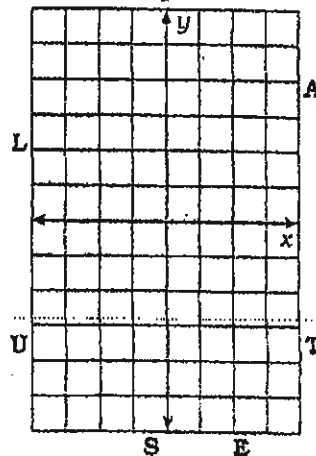
6  $y = -\frac{7}{4}x - 5$



7  $y = -\frac{1}{2}x$

8  $y = -4x + 3$

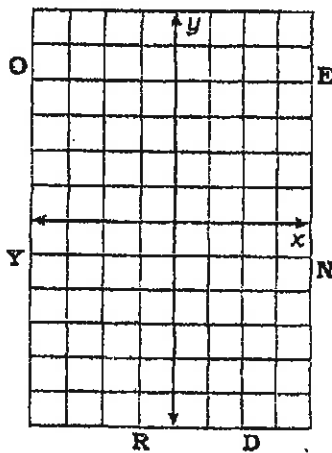
9  $y = \frac{8}{3}x - 5$



10  $y = x + 3$

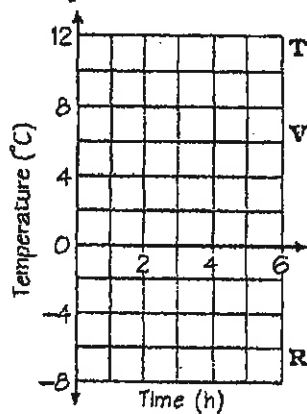
11  $y = -x - 4$

12  $y = x$



13 The temperature is  $-6^{\circ}\text{C}$  and rising at a rate of  $2^{\circ}$  per hour.

14 The temperature is  $12^{\circ}\text{C}$  and dropping at a rate of  $3^{\circ}$  per hour.

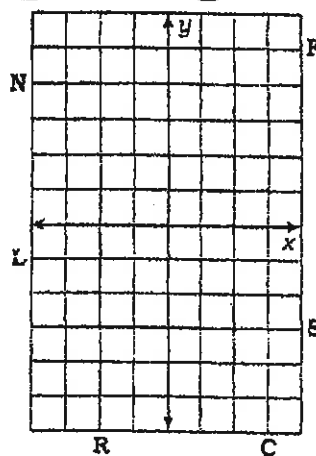


15  $y = 5$

17  $y = -1$

16  $x = -2$

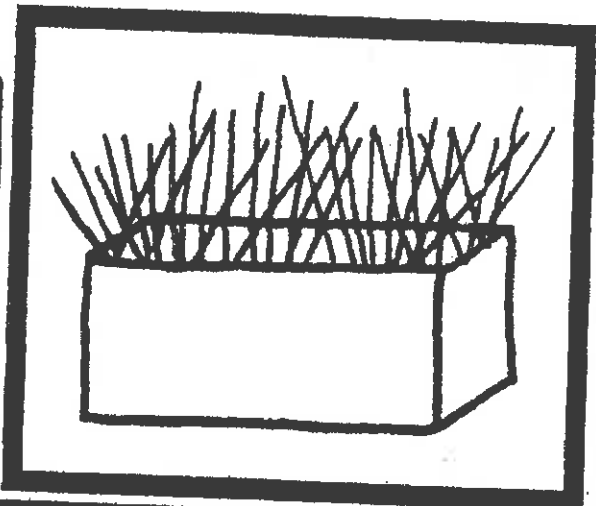
18  $x = 3$



6 12 3 9 15 1 17 7 10 14 8 18 4 13 2 16 5 11

# What Is The Title of This Picture?

Write the equation of the line through the two given points, then find your answer in the answer columns. Each time the exercise number appears in the code, write the letter of the answer above it.



Coded Title: 2 12 4 11 7 12 4 11 6 2

9 5 11 4 12 5 11 8 1 12 3 10 7

1.  $(3, 1), (9, 5)$

2.  $(1, 1), (-2, 7)$

3.  $(-4, -3), (8, 0)$

4.  $(-1, 4), (-4, -5)$

5.  $(0, -4), (-4, 6)$

6.  $(-6, 3), (6, -1)$

Answers 1-6:

V  $y = \frac{2}{3}x + 7$

K  $y = \frac{1}{4}x + 1$

S  $y = -2x + 3$

O  $y = -\frac{5}{2}x - 4$

T  $y = -\frac{1}{3}x + 1$

D  $y = -\frac{1}{3}x - 4$

A  $y = 3x + 7$

U  $y = \frac{2}{3}x - 1$

B  $y = -\frac{5}{2}x + 3$

E  $y = 3x - 2$

I  $y = \frac{1}{4}x - 2$

7.  $(-1, -6), (-3, -8)$

8.  $(-1, 3), (3, 5)$

9.  $(-2, 5), (1, -7)$

10.  $(\frac{1}{2}, 2), (-\frac{3}{2}, 4)$

11.  $(1, 3), (-7, -3)$

12.  $(-3, 8), (0, 0)$

Answers 7-12:

H  $y = \frac{1}{2}x - 3$

R  $y = \frac{3}{4}x + \frac{9}{4}$

N  $y = -x + \frac{5}{2}$

W  $y = \frac{3}{8}x$

P  $y = -\frac{8}{3}x$

C  $y = \frac{1}{2}x + \frac{7}{2}$

M  $y = -4x + \frac{9}{4}$

L  $y = -x + \frac{7}{2}$

E  $y = x - 5$

F  $y = -4x - 3$

G  $y = \frac{3}{4}x - 5$

# What Do You Call Two Birds Relaxing In the Midday Sun?



Find the equation of the line through the given point with the given slope. Cross out the letters next to each correct answer. For each letter pair you DON'T cross out, write the uppercase letter in the box with the lowercase letter.

In Exercises 1-5, write your answer in point-slope form.

1.  $(3, -4); m = 2$

Answers 1-5

**o • D**  $y = \frac{7}{2}(x - 8)$

2.  $(-1, 5); m = -\frac{4}{3}$

**g • N**  $y + 2 = -\frac{1}{6}(x - 9)$  **f • R**  $y + 4 = 2(x - 3)$

3.  $(8, 0); m = \frac{7}{2}$

**b • L**  $y + 6 = -3x$  **e • A**  $y + 5 = -\frac{4}{3}(x + 1)$

4.  $(-2, -9); m = -\frac{1}{6}$

**j • E**  $y - 5 = -\frac{4}{3}(x + 1)$  **l • I**  $y - 6 = 3x$

5.  $(0, -6); m = -3$

**n • S**  $y = -\frac{7}{2}(x + 8)$  **d • T**  $y + 9 = -\frac{1}{6}(x + 2)$

In Exercises 6-10, write your answer in slope-intercept form.

6.  $(8, 5); m = \frac{1}{4}$

Answers 6-10

**f • J**  $y = -\frac{1}{2}x - \frac{9}{2}$

7.  $(4, -1); m = -2$

**i • F**  $y = \frac{5}{3}x + 12$  **k • T**  $y = -2x + 7$

8.  $(-6, 2); m = \frac{5}{3}$

**j • O**  $y = -2x + 3$  **m • N**  $y = \frac{5}{3}x + 7$

9.  $(-7, -4); m = -\frac{1}{2}$

**e • R**  $y = 5x - \frac{15}{2}$  **b • B**  $y = 5x - 12$

10.  $(\frac{3}{2}, 0); m = 5$

**h • E**  $y = \frac{1}{4}x + 3$  **a • S**  $y = -\frac{1}{2}x - \frac{15}{2}$

In Exercises 11-15, write your answer in standard form with integer coefficients.

11.  $(-5, 2); m = \frac{2}{5}$

Answers 11-15

**k • L**  $-2x + 5y = 20$

12.  $(-6, -1); m = -4$

**e • K**  $3x - 8y = 20$  **d • S**  $-9x - 4y = -15$

13.  $(3, -3); m = -\frac{3}{8}$

**p • E**  $4x + y = -25$  **h • G**  $y = -9$

14.  $(0, \frac{1}{2}); m = \frac{9}{4}$

**k • B**  $-2x - 5y = 15$  **i • R**  $-4x + y = -9$

15.  $(\frac{16}{3}, -9); m = 0$

**d • T**  $3x + 8y = -15$  **e • P**  $-9x + 4y = 2$

a	b	c	d	e	f	g	h	i	j	k	l	m	n	o
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Quadratic Equations

$$X = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Name \_\_\_\_\_

Date \_\_\_\_\_ Period \_\_\_\_\_

Solve by the quadratic formula.

1.  $4x^2 + 12x + 7 = 0$   $x = \frac{-3 \pm \sqrt{2}}{2}$  or  $\frac{-3 - \sqrt{2}}{2}$   
 $a=4, b=12, c=7$

2.  $25x^2 - 10x - 71 = 0$

3.  $4x^2 - 16x + 11 = 0$

4.  $9x^2 - 6x - 49 = 0$

5.  $2x^2 + 10x + 11 = 0$

6.  $4x^2 - 24x - 89 = 0$

7.  $9x^2 - 6x - 79 = 0$

8.  $20x^2 - 23x + 6 = 0$

9.  $3x^2 + 7x - 8 = 0$

10.  $7x^2 - 3x - 5 = 0$

11.  $4x^2 - 28x + 37 = 0$

12.  $9x^2 + 6x - 74 = 0$

13.  $4x^2 + 16x - 109 = 0$

14.  $3x^2 + 6x + 2 = 0$

15.  $6x^2 - x + 1 = 0$

16.  $5x^2 - 7x + 8 = 0$

17.  $3x^2 + 2x + 5 = 0$

18.  $9x^2 - 6x - 19 = 0$

19.  $5x^2 - 3x - 3 = 0$

20.  $18x^2 - 27x + 10 = 0$

21.  $4x^2 + 8x - 23 = 0$

22.  $9x^2 - 38x + 17 = 0$

23.  $15x^2 - 8x + 1 = 0$

24.  $6x^2 - 7x - 2 = 0$

25.  $4x^2 + 4x - 5 = 0$

26.  $2x^2 - 14x + 11 = 0$

27.  $7x^2 - 3x + 2 = 0$

28.  $4x^2 - 12x - 11 = 0$

29.  $4x^2 - 28x + 31 = 0$

30.  $4x^2 - 8x - 23 = 0$

31.  $3x^2 - 7x - 9 = 0$

32.  $5x^2 - 3x + 1 = 0$

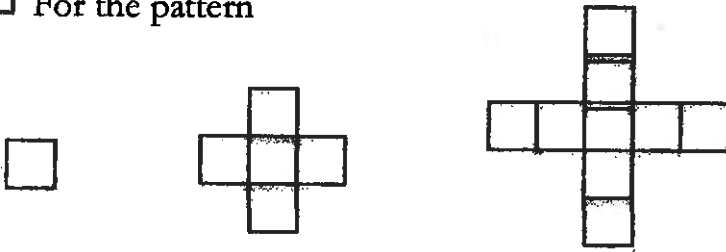
33.  $4x^2 + 4x - 17 = 0$

34.  $4x^2 - 4x - 11 = 0$

## Patterns

- For the pattern, 1, 1+2, 1+2+3, 1+2+3+4, ...
- Make a table with stages (1,2,3...) and the sum for each stage.
  - Make a visual for the first five stages in this pattern.
  - From your pictures, find a way to generalize the pattern for the sum  $1+2+3+\dots+(n-2)+(n-1)+n$ . In other words, what is the rule for the  $n$ th stage.
  - Use the pattern/rule to find the sum for the 12<sup>th</sup> stage.
  - Graph your results.

- For the pattern



- Make a table with the stages (1,2,3...) and the total number of squares for the first 10 stages.
- Describe the pattern. What is changing at each stage from the stage before?
- Generalize the pattern for the  $n$ th stage.
- Graph your results.





# 22 MINUTES

How does watching TV affect your lifespan?



## Act One: Days for a Day

- 1 According to a 2011 study from Australia, every hour of television that you watch reduces your lifespan by 22 minutes. Complete the table below to explore the relationship between TV time and lifespan lost.

	TV Watched	0 hours	1 hour		11 hours		
	Lifespan Lost			110 minutes		330 minutes	11 hours

- 2 Approximately many hours of TV would you have to watch to reduce your lifespan by a day?

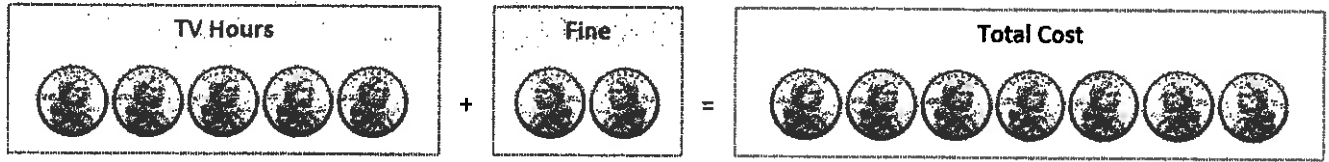
- 3 The average American watches five hours of TV each day. At this rate, how many days of television watching would it take for someone to lose a day from his/her lifespan?

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28

- 4 A baby born in the U.S. today has a life expectancy of 80 years. If someone watches five hours of television every day for his entire life, how long will he expect to live? Explain your reasoning.

## Act One: Cost of a Day

- 5 A student thought about the problem differently. She said, "Watching five hours of TV really costs around seven hours," and drew the picture below. Based on this, how much do you think she'd say an average day would cost? Explain.



- 6 Once again, calculate the life expectancy for someone who watches five hours of television each day. This time, use the student's "cost of a day" method from above. Do you get the same result as before?

- 7 We've looked at two different ways to calculate the life expectancy for the average TV-watching American: the "days for a day" method and the "cost of a day" method. Which method do you prefer and why?