
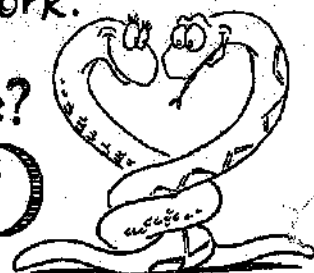


Alg. 2 Snow Packet #6 Show your work.

What Did the Boy Snake Say to the Girl Snake?

Write the letter of the correct answer in the box containing the exercise number.
If the answer has a , shade in the box instead of writing a letter in it.



Solve by finding square roots. Express irrational solutions using radicals.

- ① $x^2 = 64$ ② $n^2 = 83$ ③ $7c^2 = 91$
 ④ $3w^2 = 588$ ⑤ $y^2 - 121 = 0$ ⑥ $4a^2 - 9 = 35$
 ⑦ $5x^2 + 12 = 87$ ⑧ $8t^2 - 82 = -10$ ⑨ $8t^2 - 10 = -82$

- ⑩ A square field has an area of 1024 ft^2 . Find the length of a side.

Leave answers in simplest radical form.
For the puzzle,

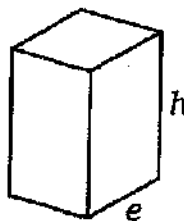
Solve by finding square roots. Express irrational solutions as decimals rounded to the nearest tenth. In Exercises 20-21, use 3.14 for π .

- ⑪ $3k^2 + 4 = 64$ ⑫ $5 + 16b^2 = 117$ ⑬ $70 - 2m^2 = 0$
 ⑭ $\frac{x^2}{4} - 15 = 8$ ⑮ $10 + \frac{a^2}{9} = 26$ ⑯ $11 - \frac{1}{2}y^2 = -4$
 ⑰ $5d^2 + 2 = 3.8$ ⑱ $49x^2 = 16$ ⑲ $81t^2 - 100 = -99$

- ⑳ Roundup Elementary School wants a large circle painted on the playground. The painter has a gallon can that will cover 400 ft^2 . Find the radius of the largest circle he can paint. (Use $A = \pi r^2$)

- ㉑ Atlas Globe Co. wants to produce a globe with a surface area of 900 in^2 . The surface area is given by the formula $A = 4\pi r^2$, where r is the radius of the sphere. What should the radius be?

- ㉒ Suppose you are designing a juice carton in the shape of a square prism. The volume is given by the formula $V = e^2h$, where e is the length of an edge of the base and h is the height. You want the volume to be 1000 cm^3 and the height to be 16 cm. How long should an edge of the base be?



Answers 1-10

⓪ $\pm\sqrt{13}$

Ⓛ ± 8

Ⓦ ± 11

ⓗ 32 ft

Ⓢ $\pm\sqrt{15}$

● ± 14

Ⓝ 28 ft

ⓖ $\pm\sqrt{83}$

Ⓣ ± 3

Ⓐ $\pm\sqrt{11}$

Ⓡ $\pm\sqrt{10}$

● no solution

Answers 11-22

Ⓜ 7.2 cm

Ⓒ ± 5.9

Ⓝ 9.2 in.

Ⓤ $\pm \frac{1}{9}$

● ± 0.6

ⓗ 7.9 cm

⓪ ± 9.6

Ⓚ 11.3 ft

● ± 2.6

Ⓣ ± 3.4

Ⓐ ± 5.5

Ⓤ ± 4.5

ⓗ 12.5 ft

Ⓢ $\pm \frac{4}{7}$

Ⓑ 8.5 in.

Ⓔ ± 12

10	14	5	12	16	21	3	11	8	4	6	17	15	19	1	13	20	9	22	7	2	18
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From What Malady Do Politicians Often Suffer?

Solve the equation or problem by factoring. Find your solution at the bottom of the page and cross out the letter under it. When you finish, the answer to the title question will remain.

1 $u^2 + 19u = -60$

2 $3d^2 = 10 - 13d$

3 $7x^2 - 10x = 6x^2 - 21$

4 $3a^2 + a = a^2 + 10a + 11$

5 $n(n + 3) = 70$

6 $b(5b - 4) = 12$

7 $(w + 5)(w + 2) = 40$

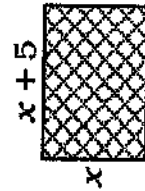
8 $4t^2 - 9t + 16 = 15 - 4t^2$

9 $(2k + 4)(2k + 9) = 3k^2 + 11k$

10 $5 + 6y(y + 2) = 5y + 8$

11 $(m - 3)^2 = 64$

- 12 The length of a rectangle is 5 cm more than the width. The area is 84 cm^2 . Find the dimensions of the rectangle.



- 13 A square banner had 4 ft added to its width and 2 ft subtracted from its height. The banner then had an area of 91 ft^2 . How long was a side of the original square banner?

- 14 The dimensions of a rectangular garden were 3 m by 10 m. When both dimensions were increased by the same amount, the area of the garden doubled. Find the dimensions of the new garden.

Answers - Odd-Numbered Exercises

S	$\{-5, 11\}$	T	$\{-2, 15\}$	O	$\{-3, -12\}$	P	$\{3, 7\}$	Q	$\{-9, -4\}$	R	$\{-15, -4\}$	S	9 ft	T	$\{-10, 3\}$	U	8 ft	V	$\{-10, -7\}$	W	$\{-3, 7\}$	X	$\{-10, 7\}$
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Answers - Even-Numbered Exercises


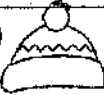










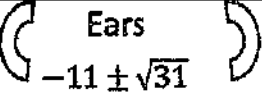





D	$\{-\frac{1}{2}, 1\}$	O	$5 \times 12 \text{ m}$	S	$\{\frac{11}{2}, -1\}$	E	$\{\frac{5}{2}, -2\}$	I	$\{-\frac{3}{2}, \frac{1}{2}\}$	C	$8 \times 13 \text{ cm}$	K	$\{-\frac{5}{6}, 2\}$	N	$7 \times 12 \text{ cm}$	A	$\{8, -1\}$	M	$\{2, -5\}$	E	$\{\frac{1}{8}, 1\}$	Y	$4 \times 15 \text{ m}$
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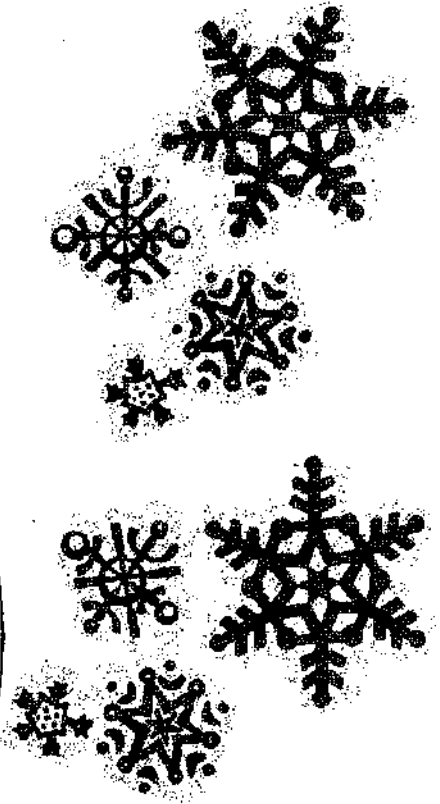
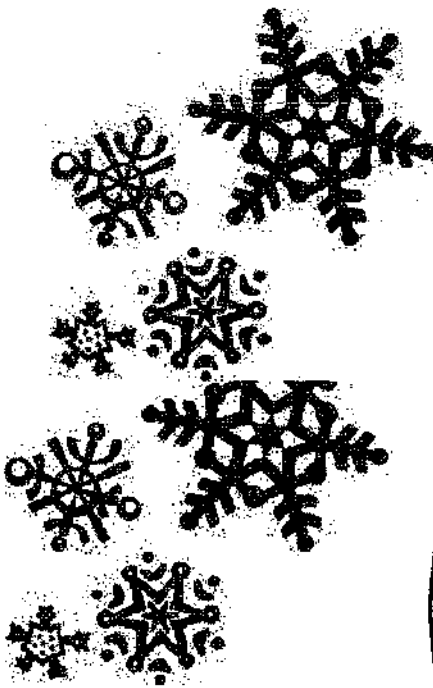
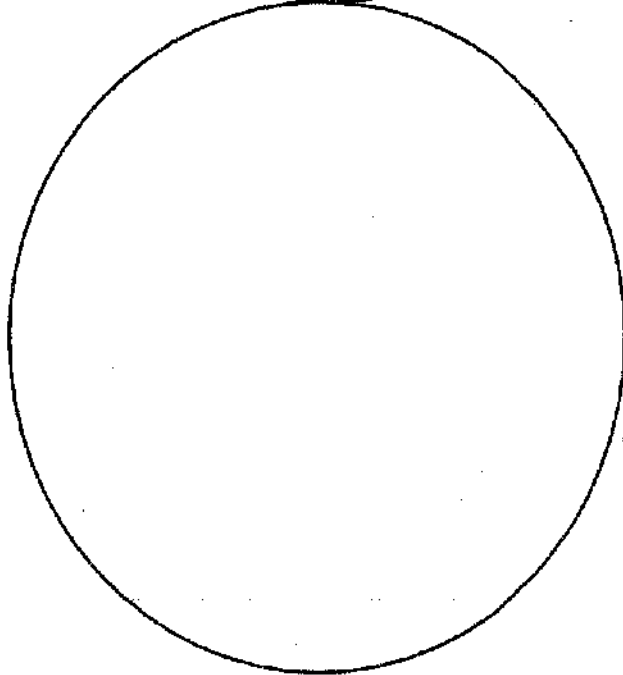
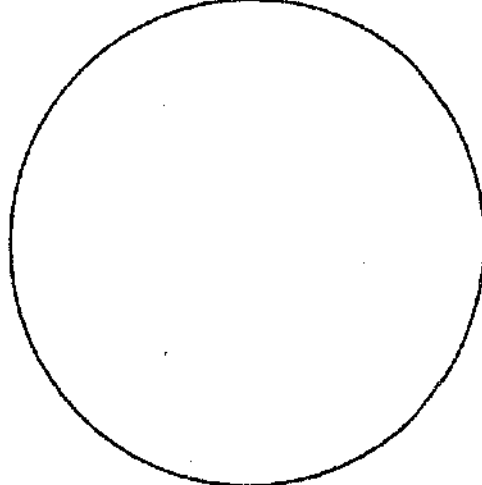
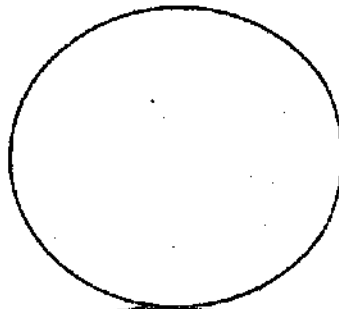
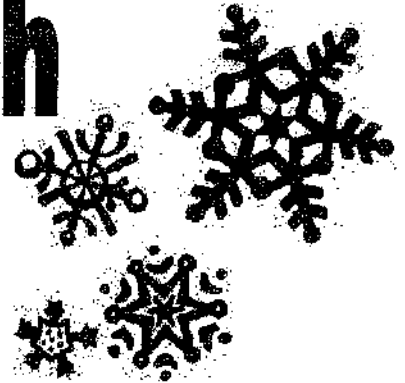
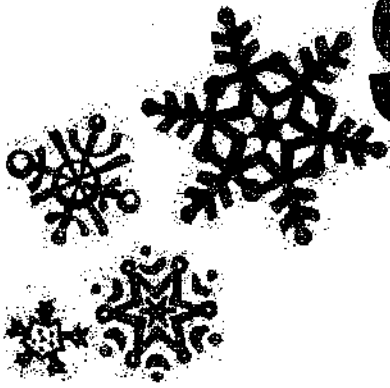
Snowman Math

Solve each quadratic equation. Then circle the box that has the exact answer.

Finally, color the snowman using your answers.

1. $5x^2 + 12x + 3 = 0$	 Top Hat $\frac{-6 \pm \sqrt{21}}{10}$	Toboggan  $\frac{-6 \pm \sqrt{21}}{5}$
2. $12x^2 + 22x + 5 = 0$	Eyelashes  $\frac{-11 \pm \sqrt{61}}{12}$	No Eyelashes  $\frac{-11 \pm \sqrt{61}}{24}$
3. $3x^2 + 6x + 1 = 0$	Round Nose  $\frac{-3 \pm \sqrt{6}}{3}$	Triangular Nose  $-1 \pm \sqrt{2}$
4. $4x^2 = 49$	Mouth with 4 dots  $\frac{7}{2}$	Mouth with 3 dots  $\pm \frac{7}{2}$
5. $7x^2 + 5x - 10 = 0$	 Striped Scarf $\frac{-5 \pm \sqrt{305}}{14}$	 Solid Scarf $\frac{-5 \pm \sqrt{95}}{21}$
6. $6x^2 + 5x + 11 = 0$	 2 buttons on belly $\frac{-5 \pm i\sqrt{37}}{12}$	 3 buttons on belly $\frac{-5 \pm i\sqrt{239}}{12}$
7. $6x^2 + 22x + 15 = 0$	 Ears $\frac{-11 \pm \sqrt{31}}{6}$	No ears $\frac{-11 \pm \sqrt{31}}{12}$
8. $2x^2 + 4x + 6 = 0$	 Glasses $2, -2$	No glasses $-1 \pm i\sqrt{2}$
9. $4x^2 + 12x - 27 = 0$	Right Hand Up  $\frac{3}{2}, -\frac{9}{2}$	Right Hand Down  $2 \pm 2\sqrt{6}$
10. $2x^2 - 6x - 56 = 0$	 Left Hand Up $7, -4$	 Left Hand Down $4, -7$

Snowman Math



Examples

1. The length of a rectangular garden is 4 yards more than its width. The area of the garden is 60 square yards. Find the dimensions of the garden.
2. The width of a rectangle is 5 meters less than its length. The area is 84 square meters. Find the dimensions of the rectangle.
3. The length of a rectangle is 2 less than three times the width. Find the dimensions of the rectangle if the area is 65 square meters.
4. Find two consecutive even integers such that the product is 1520.
5. The product of two consecutive odd integers is 1 less than twice their sum. Find the integers.
6. The product of two consecutive integers is 5 more than three times the larger. Find the integers.
7. The hypotenuse of a right triangle is 1 centimeter longer than the longer leg. The shorter leg is 7 centimeters shorter than the longer leg. Find the length of the longer leg of the triangle.

1. width $\Rightarrow x$
length $\Rightarrow x+4$

$$\begin{aligned} x(x+4) &= 60 \\ x^2 + 4x &= 60 \\ x^2 + 4x - 60 &= 0 \\ (x+10)(x-6) &= 0 \\ x &= -10 \quad x = 6 \end{aligned}$$

width $\Rightarrow 6$ yards
length $\Rightarrow 10$ yards

(or use quadratic formula!)

2. length $\Rightarrow x$
width $\Rightarrow x-5$

$$\begin{aligned} x(x-5) &= 84 \\ x^2 - 5x - 84 &= 0 \\ (x-12)(x+7) &= 0 \\ x &= 12 \quad x = -7 \end{aligned}$$

length $\Rightarrow 12$ meters
width $\Rightarrow 7$ meters

3. width $\Rightarrow x$
length $\Rightarrow 3x-2$

$$\begin{aligned} x(3x-2) &= 65 \\ 3x^2 - 2x - 65 &= 0 \\ (3x+13)(x-5) &= 0 \\ x &= -13/3 \quad x = 5 \end{aligned}$$

width $\Rightarrow 5$ meters
length $\Rightarrow 13$ meters

4. x
 $x+2$

$$\begin{aligned} x(x+2) &= 1520 \\ x^2 + 2x - 1520 &= 0 \\ (x+40)(x-38) &= 0 \\ x &= -40 \quad x = 38 \end{aligned}$$

2 sets of answers
-40 and -38
38 and 40

5. x
 $x+2$

$$\begin{aligned} x(x+2) &= 2(x+x+2) - 1 \\ x^2 + 2x &= 4x + 4 - 1 \\ x^2 - 2x - 3 &= 0 \\ (x-3)(x+1) &= 0 \\ x &= 3 \quad x = -1 \end{aligned}$$

2 sets of answers
3 and 5
-1 and 1

6. x
 $x+1$

$$\begin{aligned} x(x+1) &= 5 + 3(x+1) \\ x^2 + x &= 5 + 3x + 3 \\ x^2 - 2x - 8 &= 0 \\ (x-4)(x+2) &= 0 \\ x &= 4 \quad x = -2 \end{aligned}$$

2 sets of answers
4 and 5
-2 and -1

7. longer leg $\Rightarrow x$
shorter leg $\Rightarrow x-7$
hypotenuse $\Rightarrow x+1$

$$\begin{aligned} a^2 + b^2 &= c^2 \\ x^2 + (x-7)^2 &= (x+1)^2 \\ x^2 + x^2 - 14x + 49 &= x^2 + x + 1 \\ x^2 - 16x + 48 &= 0 \\ (x-12)(x-4) &= 0 \\ x &= 12 \quad x = 4 \end{aligned}$$

Longer leg = 12 cm

does not work b/c shorter leg would be -3

Alg.2 Snow Packet #9

Write an equation and solve each problem.
Show your work.

Quadratic Word Problems

1. The width of a rectangle is 11 inches less than its length. Find the dimensions of the rectangle if the area is 80 square inches.
2. The length of a rectangle is 1 foot more than twice the width. The area is 55 square feet. Find the dimensions of the rectangle.
3. The product of two consecutive integers is 56. Find the integers.
4. The product of two consecutive positive odd integers is 99. Find the integers.
5. Find two consecutive even integers such that the square of the smaller is 10 more than the larger.
6. The product of two consecutive odd integers is one less than four times their sum. Find the two integers.
7. One leg of a right triangle is one inch shorter than the other leg. If the hypotenuse is 5 inches, find the length of the shorter leg.
8. The longer leg of a right triangle is two inches more than twice the length of the shorter leg. The hypotenuse is two inches less than three times the length of the shorter leg. Find the length of the hypotenuse.

Alg. 2 Snow Packet #10 Show your work.

Word Problems with Quadratics

Check the validity of your answers. For example, the quadratic equation may present a negative root, but this cannot be a correct solution for a measure of distance or time.

1. Find two, positive, consecutive, even integers whose product is 624.
2. Find two consecutive odd integers whose product is 1599.
3. The number of calories in a banana is 15 more than the number of calories in an orange. The product of the numbers is 6750. Find the number of calories in the orange.
4. The width of a painting is 4 inches less than the length, and the surface area is 320 square inches. Find the length.
5. The square of a number is 70 more than 9 times the number. Find the number.
6. A rectangle has a perimeter of 38 feet and an area of 88 square feet. Find the dimensions.
7. The sum of the squares of two positive consecutive integers is 145. Find the integers.
8. The length of a rectangle is 3 meters less than twice the width. If the area is 104 square meters, find the length.
9. A square has 2 inches added to its length and 1 inch added to its width, creating an area of 42 square inches. Find the length of a side of the original square.
10. The width of a rectangle is 5 centimeters less than the length. The area is 36 square centimeters. Find the length.