

Sail into Summer with Math!



For Students Entering Geometry

Squares, Square Roots, and the Laws of Exponents

Exercises: Evaluate:

1. $(8 - 4) =$

2. $(4 - 2) (5 - 8) =$

3. $5 (8 - 3) =$

4. $\sqrt{25 - 16} =$

5. $\sqrt{5(9 \cdot 125)} =$

6. $\sqrt{(8 - 4)(1 + 3)} =$

Simplify the following problems using exponents (Do not multiply out):

7. $5^2 5^4 =$

8. $(12^4)^3 =$

9. $5^9 \div 5^4 =$

10. $10^3 \div 10^{-5} =$

11. $7^{-3} =$

12. $3^{-4} =$

13. $(3^3 \cdot 3^2)^3 =$

14. $5^3 \cdot 5^4 \div 5^7 =$

Solving Equations I

Exercises:

SHOW ALL WORK.

1. $-4t + 3t - 8 = 24$

2. $\frac{m}{-5} + 6 = 4$

3. $-4r + 5 - 6r = -32$

4. $\frac{x}{-3} + (-7) = 6$

5. $6g + (-3) = -12$

6. $\frac{y}{-2} + (-4) = 8$

7. $9 - 5(4 - 3) = -16 + \frac{x}{3}$

8. $6t - 14 - 3t = 8 (7 - (-2))$

9. $7(6 - (-8)) = \frac{t}{-4} + 2$

10. $7(3 - 6) = 6(4 + t)$

11. $4r + 5r - 8r = 13 + 6$

12. $3(7 + x) = 5(7 - (-4))$

7. **Rowboat Rentals:** \$5.00 per hour plus a \$100.00 deposit. *Deposit will be refunded if the boat is returned undamaged.*

Which equation represents the total cost for renting and returning a row-boat undamaged?

Let c be the total cost in dollars and t be the time in hours.

a. $c = 5t + 100$

b. $c = 500t$

c. $c = 100t + 5$

d. $c = 5t$

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8. Ted wants to buy a \$400.00 bike. He has two options for payment.

Option One: Ted can borrow the \$400.00 from his father and repay him \$40.00 a month for a year.

Option Two: The bike shop will finance the bike for one year at a 15% annual interest rate. The formula for the total amount paid (a) is:

$$a = p + prt, \text{ where } p \text{ is the amount borrowed, } r \text{ is the rate of interest, and } t \text{ is the time in years.}$$

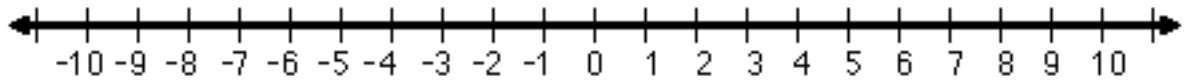
Which option would cost Ted the least amount of money?

Explain how you determined your answer. Use words, symbols, or both in your explanation.

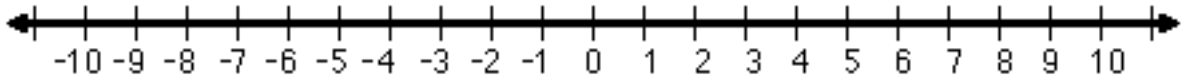
Inequalities

Exercises: Solve the following problems:

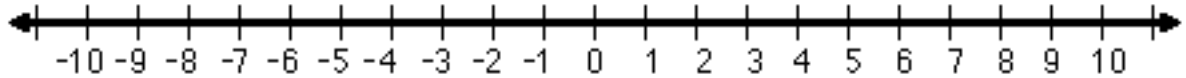
1. $4x > 9$



2. $-5t \geq -15$



3. $\frac{x}{-4} > 2$



Solving Systems of Equations

Exercises: Solve each system of equations using any method.

1. $3x - 4y = 3$
 $6x + 8y = 54$

2. $9 = 5x + 2y$
 $-31 = 3x - 4y$

3. $2x - 7y = 19$
 $-6x - 21y = -15$

4. $4x - 11y = -9$
 $-6x + 22y = 8$

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5. Hanz and Mario went to a sale at a music store where all CDs were one price and all cassettes were another price. Hanz bought 2 CDs and 2 cassettes for \$40.00, while Mario bought 1 CD and 4 cassettes for \$44.00.

The equations below represent these purchases, where x is the cost of a CD and y is the cost of a cassette.

Hanz $2x + 2y = 40$

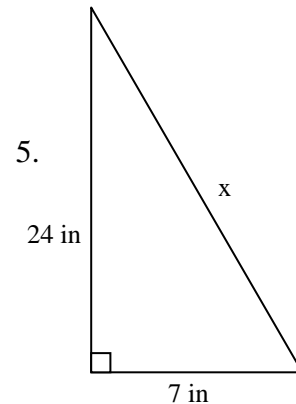
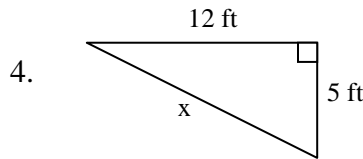
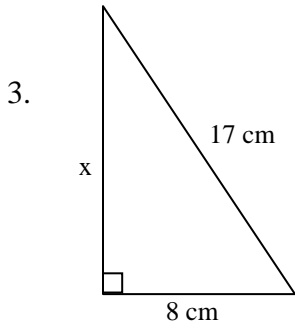
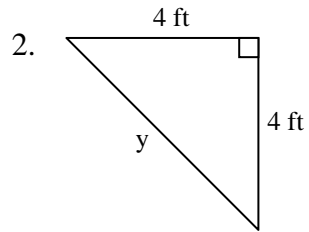
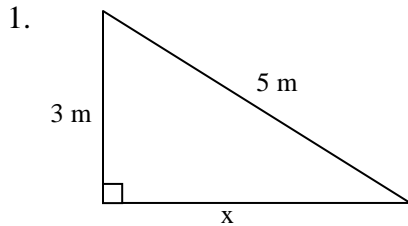
Mario $x + 4y = 44$

What are the costs of a single CD and a single cassette? Solve the system of equations by either constructing a graph on a sheet of graph paper or by using an algebraic process. Explain how you determined the costs. Use words, symbols, or both in your explanation.

6. An exam will have 20 questions and be worth a total of 100 points. There will be a true/false section where the questions are worth 3 points each and a short essay section where the questions will be worth 11 points each. How many essay questions will there be on the test?

Pythagorean Theorem

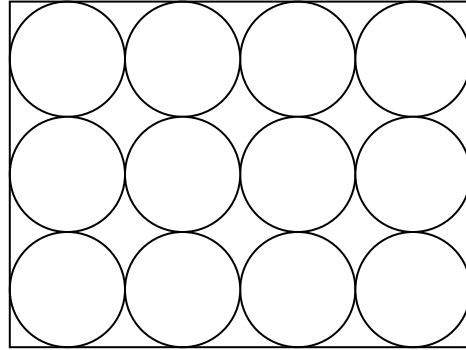
Exercises: Solve for the variable:
SHOW ALL WORK.



Irregular Area

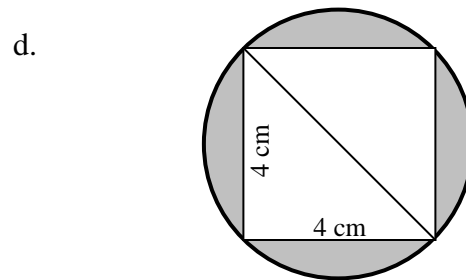
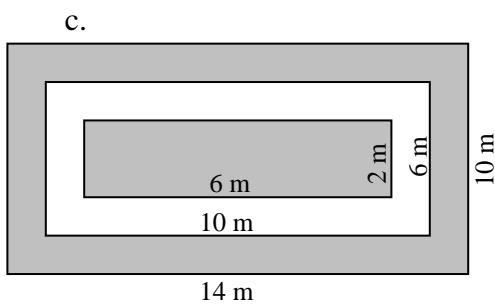
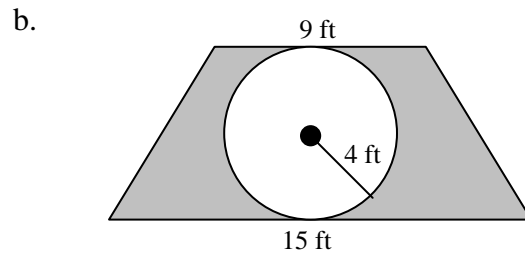
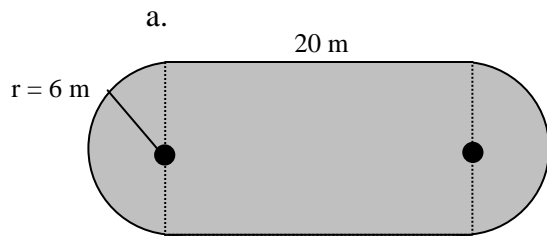
Exercises:

1. The baking sheet shown holds 12 cookies. Each cookie has a diameter of 3 inches.



What is the area of the unused part of the baking sheet? Round your answer to the nearest square inch.

2. Find the area of the shaded regions.



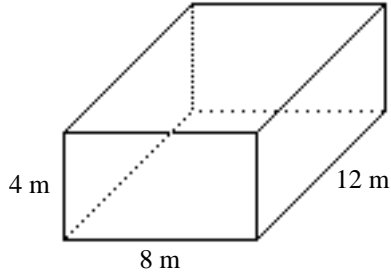
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Volume and Surface Area

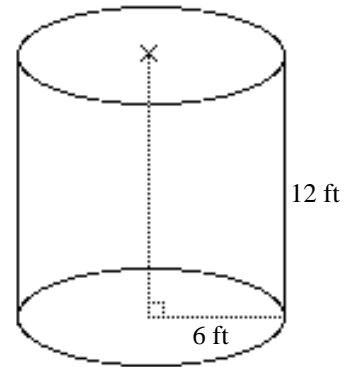
Exercises: Find the volume and surface area of the following figures:
SHOW ALL WORK.

Note: Use $\pi = 3.14$

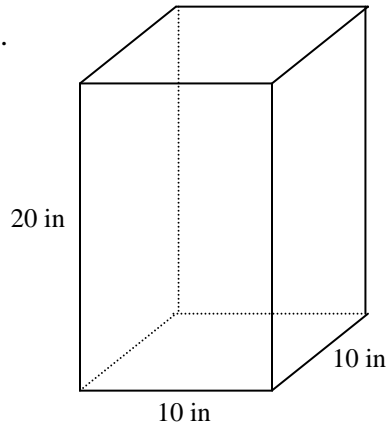
1.



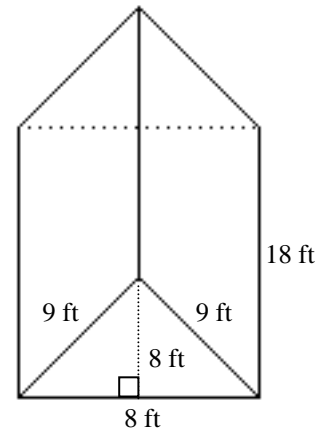
2.



3.

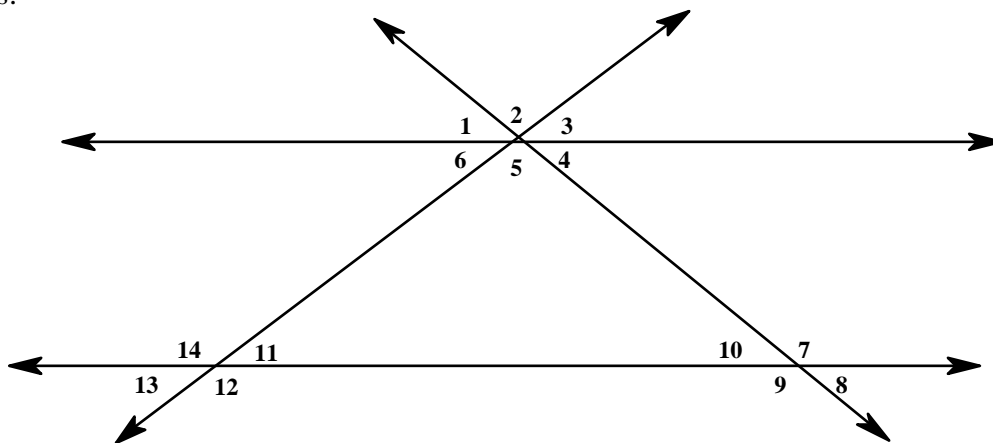


4.



Angle Relationships

Exercises:



If the measure of Angle 10 is 54° and Angle 11 is 46° , what is the measure of:

- | | |
|----------------------|----------------------|
| 1. Angle 1 = _____ | 2. Angle 2 = _____ |
| 3. Angle 3 = _____ | 4. Angle 4 = _____ |
| 5. Angle 5 = _____ | 6. Angle 6 = _____ |
| 7. Angle 7 = _____ | 8. Angle 8 = _____ |
| 9. Angle 9 = _____ | 10. Angle 12 = _____ |
| 11. Angle 13 = _____ | 12. Angle 14 = _____ |

Factoring Quadratic Equations

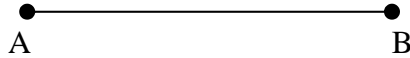
Exercises: Find the roots of each equation.

- | | |
|-------------------------|-------------------------|
| 1. $a^2 + a - 30 = 0$ | 2. $b^2 + 7b + 12 = 0$ |
| 3. $m^2 - 14m + 40 = 0$ | 4. $s^2 + 3s - 180 = 0$ |
| 5. $7a^2 + 22a + 3 = 0$ | 6. $2x^2 - 5x - 12 = 0$ |

Constructions I

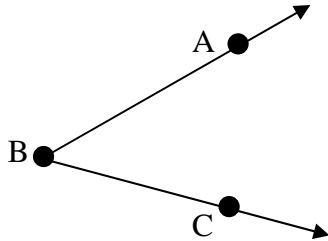
Copy a line segment (use only a compass and a straight edge - no measuring)

Draw a segment longer than the original segment (AB). Mark a point (A') on this drawn segment. Place the compass tip on point A. Draw an arc through B. Place the compass point on A'. Use the same compass opening to draw an arc intersecting the segment. Label the intersection B'.



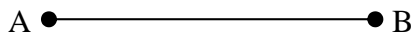
Copy an angle

Draw a ray and label it ray B'C'. Place the metal tip on B. Strike an arc intersecting rays BA and BC. Without changing the compass setting, put the metal tip on B', and strike an arc intersecting ray B'C'. Label the points of intersection P and Q on the original, and Q' on the copy. Place the compass tip on Q and use the compass to measure the distance to P. Without changing the compass setting, place the metal tip on Q' and make an arc intersecting with the first arc through Q'. Label the intersection of the arcs P'. Draw ray B'P'.



Bisect a line

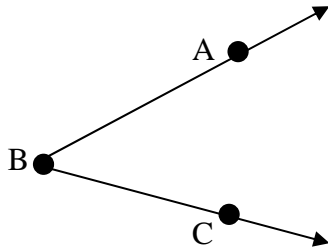
With the compass setting greater than one-half the distance from A to B, place the metal tip on A and strike arcs above and below the segment. Without changing the compass setting, place the metal tip on B and do the same thing. Draw PQ. It will intersect AB at its midpoint forming 90 degree angles.



Constructions II

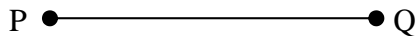
Bisect an angle

Place the metal tip of the compass on vertex B and strike an arc that intersects both sides of the angle. Label the intersections P and Q. Place the metal tip on P and with the compass setting greater than one-half the distance from P to Q, strike an arc. Without changing the setting, place the metal tip on Q and strike an arc, intersecting the one drawn from P. Label the intersection of the arcs D. Draw BD. It is the bisector.



Construct a perpendicular through a point off the line

Place metal tip of the compass on A and with the compass setting greater than the distance from A to the line, strike an arc with intersects the line twice (you might need to extend the line). Label the intersections R and S. Place the metal tip first on S, and without changing the compass setting, strike an arc on the other side of the line. Then do the same from R. Label the intersection of these arcs B. Draw AB, and it is the perpendicular bisector and PQ.



Geometry Summer Packet Key

Square Roots

1) 4 2) -6 3) 25 4) 3 5) 75 6) 4

7) 5^6

8) 12^{12}

9) 5^5

10) 10^8

11) $\frac{1}{7^3}$

12) $\frac{1}{3^4}$

13) 3^{15}

14) 1

Solving Equations

1) $t = -32$ 2) $m = 10$ 3) $r = 3.7$ 4) $x = -37$

5) $g = -3/2$ 6) $y = -24$ 7) $x = 72$ 8) $t = 86/3$

9) $t = -384$ 10) $t = -45/6$ 11) $r = 19$ 12) $x = 34/3$

7) Rowboat rental: d

8) Borrowing money from the bike shop would cost Ted less money. Borrowing the money from the shop would cost Ted \$460 while borrowing from his father would cost \$480.

Inequalities

$$1) x > \frac{9}{4}$$

$$2) t < 3$$

$$3) x < -8$$

Solving Systems of Equations

$$\square (5,3)$$

$$\square (-1,7)$$

$$\square (6,-1)$$

$$\square (-5,-1)$$

$$\square \text{ Hanz } 2x+2y=40$$

$$\text{Mario } x+4y=44 \quad \text{So } x=44-4y$$

$$\text{Plug In: } 2x+2y=40$$

$$2(44-4y)+2y=40$$

$$x=12, y=8$$

One CD is \$12 and one cassette is \$8.

$$\square \text{ Let } x=\text{true/false questions}$$

$$y=\text{short essay}$$

$$x+y=20$$

$$3x+11y=100$$

There will be 15 true/false and 5 short essay questions.

Pythagorean Theorem

$$\blacklozenge x=4$$

$$\blacklozenge y = 4\sqrt{2}$$

$$\blacklozenge x=15$$

$$\blacklozenge x=13$$

$$\blacklozenge x=25$$

Irregular Area

7. 23.18 inches square is unused
8. a) 353.1 units square
b) 45.73 units square
c) 92 units square
d) 9.13 units square

Volume and Surface Area

- 1) 384
- 2) 1356.48
- 3) 2000
- 4) 576

Angle Relationships

- | | | | |
|--------|---------|--------|--------|
| 1) 54 | 2) 80 | 3) 46 | 4) 54 |
| 5) 80 | 6) 46 | 7) 126 | 8) 54 |
| 9) 126 | 10) 134 | 11) 46 | 12) 46 |

Factoring Quadratic Equations

- 1) {5, -6}
- 2) {-3, -4}
- 3) {4, 10}
- 4) {12, =15}
- 5) {-1/7, -3}
- 6) {4, -3/2}