Geometry

Day	Topic	Homework	IXL
1	Review Formulas	Worksheet 1	7.AA.2
2	Derive Volume of any Right Prism	Worksheet 2	7.AA.3
3	Circumference of a Circle	Worksheet 3	7.AA.7
4	Area of a Circle	Worksheet 4	7.AA.4
5	Convert Area to Circumference and Back Again	Study for quiz	7.AA.6
6	Quiz with Formulas	Worksheet 5	7.AA.8
7	Derive Surface Area of a Right Prism and Volume of a Cylinder	Worksheet 6	8.T.9
8	Derive Volume of a Cone and a Sphere	Worksheet 7	8.T.10
9	Practice	Review Worksheet	8.T.13
10	Review	Study for Test	
11	Unit Test	none	

Day 1

Write down all of the formulas for area that you can remember and give an example of each.

Perimeter : add all sides

$A(\text{triangle}) = \frac{1}{2}bh$

$= \frac{1}{2}(2)(5)$

$= 5 \text{ cm}^2$

? $A(\text{circle}) = \pi r^2$

$A(\text{square}) = s^2$

$= 4^2$

$= 16 \text{ ft}^2$

$A(\text{parallelogram}) = bh$

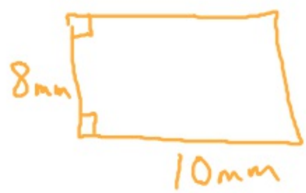
$= 9(7)$

$= 63 \text{ in}^2$

$A(\text{rectangle}) = lw$

$= 10(8)$

$= 80 \text{ mm}^2$



$A(\text{trapezoid}) = \frac{1}{2}h(b_1 + b_2)$

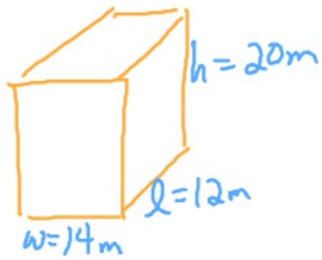
Half the height times the sum of the bases

$\frac{1}{2}(4)(6+9)$

30 in^2

$V = lwh$

Volume (rectangular prism)



$$V = lwh$$
$$= 12(14)(20)$$
$$= 3360\ m^3$$

SA (rectangular prism) $= 2(lw + wh + lh)$

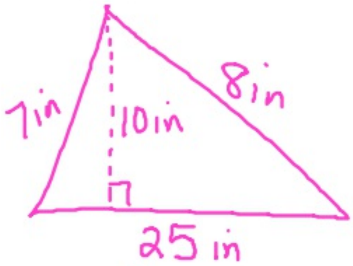
OR

$$2lw + 2wh + 2lh$$
$$= 2 \cdot 12 \cdot 14 + 2 \cdot 14 \cdot 20 + 2 \cdot 12 \cdot 20$$
$$= 336 + 560 + 480$$
$$= 1376\ m^2$$

Formulas

Perimeter of any shape: Total the distance around the shape (add all sides)

Area of a Triangle: $A = \frac{1}{2}bh$



$A = \frac{1}{2}bh$

$A = \frac{1}{2}(25)(10)$

$A = 125 in^2$

Area of a Square: $A = s^2$

Area of a Rectangle: $A = lw$

Area of a Parallelogram: $A = bh$

Area of a Trapezoid: $A = \frac{1}{2}h(b_1 + b_2)$

Area of a Circle:

Circumference of a Circle:

Surface Area of a Rectangular Prism: $SA = 2lw + 2wh + 2lh$ or $SA = 2(lw + wh + lh)$

Surface Area of Any Right Prism/Pyramid: Add the areas of all the sides

Volume of a Rectangular Prism: $V = lwh$

Volume of Any Right Prism/Pyramid: $V = BH$

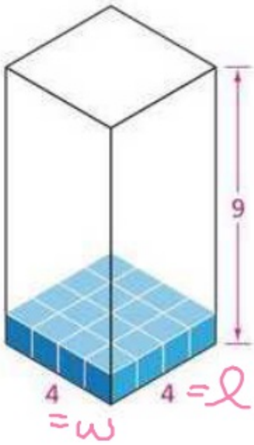
Volume of a Cylinder:

Volume of a Cone:

Volume of a Sphere:

Day 2

To calculate the exact volume of a rectangular prism, you could visualize packing it with layers of identical cubes. This works well for square prisms.



9 layers of 16 cubes $(4 \cdot 4)$

Find the volume.

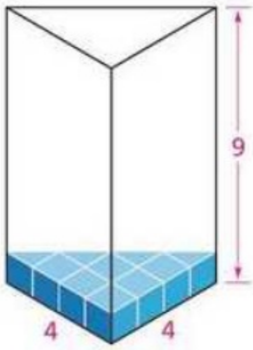
$V = \ell w h$

$V = 4(4)(9)$

$V = 144$ unit cubes

units^3

cu. units



- How many cubes would you need to fill the prism?

72 cubes

9 layers of 8 cubes.

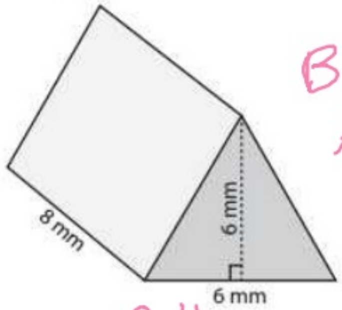
$\left(A(\triangle) = \frac{1}{2}bh = \frac{1}{2} \cdot 4 \cdot 4\right)$

We find that calculating the volume is the same for any right prism – no matter what the shape of the base is. Remember: by definition, a right prism has a polygonal base and rectangular lateral faces.

The volume for any right prism is: $V = BH$

B ↑ area of base; H ← height of the prism (distance between the 2 bases)

Examples:



B = Area of Triangle

$A = \frac{1}{2}bh$

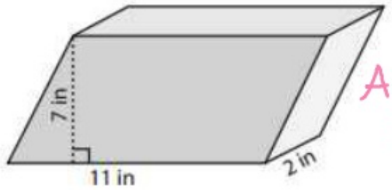
$= \frac{1}{2}(6)(6)$

$= 18 \text{ mm}^2$

Volume = BH

$= 18(8)$

$= 144 \text{ mm}^3$



$A = bh$

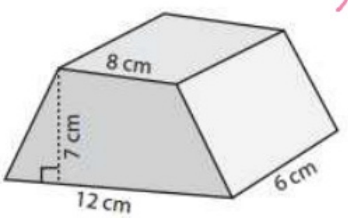
$= 11 \cdot 7$

$= 77$

Volume = BH

$= 77(2)$

$= 154 \text{ in}^3$



$A = \frac{1}{2}h(b_1 + b_2)$

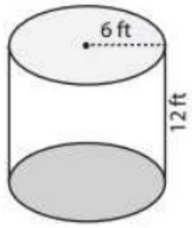
$= \frac{1}{2} \cdot 7(8+12)$

$= 70$

Volume = BH

$= 70 \cdot 6$

$= 420 \text{ cm}^3$



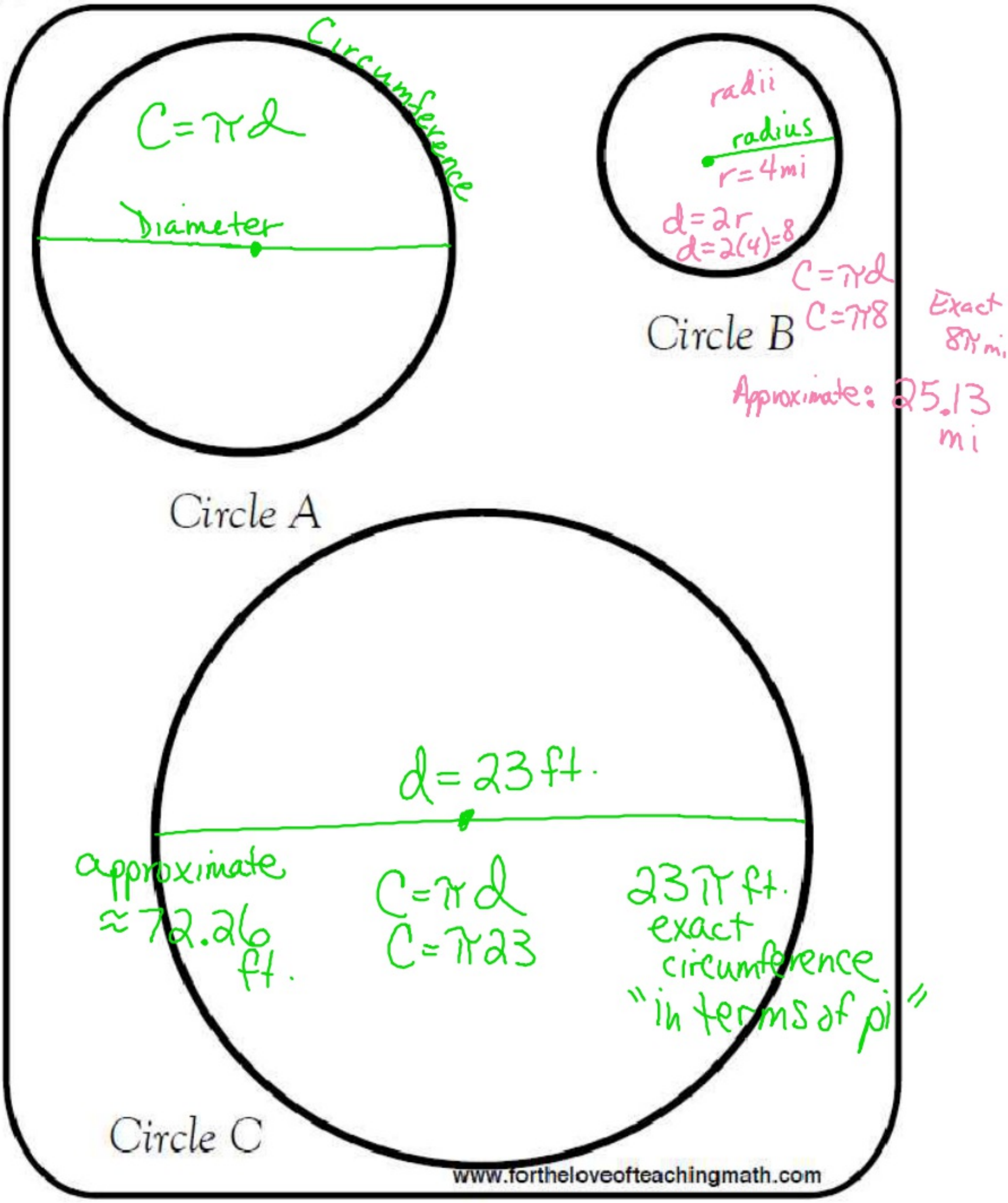
Area of the base = 113.1 sq ft

Volume = BH

$= 113.1 \cdot 12$

$= 1357.2 \text{ ft}^3$

Day 3


Circumference
C=πd
Diameter
Circle A
radii
radius
r=4mi
d=2r
d=2(4)=8
C=πd
C=π8
Exact
8π mi
Circle B
Approximate: 25.13 mi
d=23 ft.
approximate
≈72.26 ft.
C=πd
C=π23
23π ft.
exact circumference
"in terms of pi"
Circle C
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B) 1) 8km $= x$

$$y = .50x + 5$$
$$y = .50(8) + 5$$
$$y = \$9$$

2) \$10 $= y$

$$10 = .50x + 5$$
$$-5 \qquad\qquad -5$$
$$5 = .50x$$
$$\frac{5}{.50} = \frac{.50x}{.50}$$
$$10 = x$$
km

3) (12,11)

We walked 12 km and earned \$11.

4)Alana's plan \$5

a) table? at 0 km she earned \$5

b) graph? line starts @5 where her line crosses the y-axis

c) equation? added to the x → constant

Inv 1.4

Week	Amount of Money at the End of Each Week
0	144
1	132
2	120
3	108
4	96
5	84

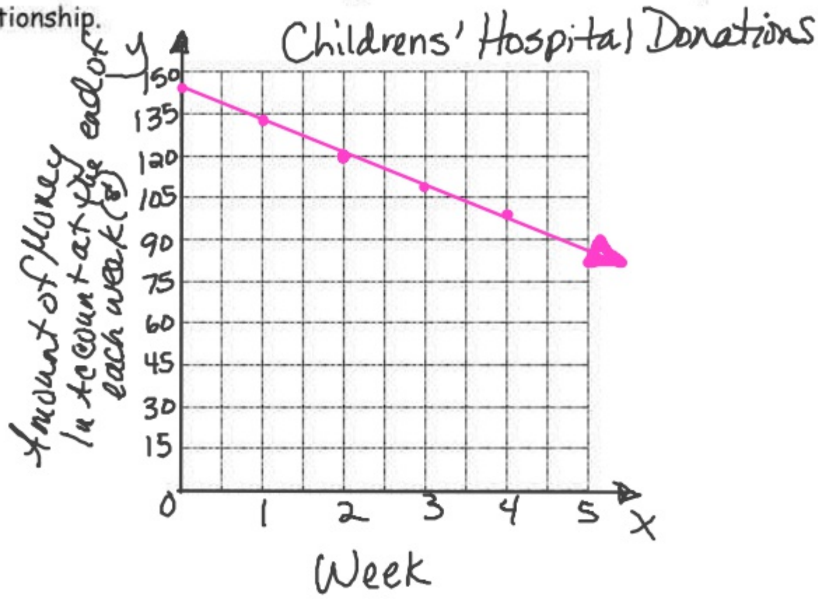
-12

$$\begin{array}{r} 144 \\ -132 \\ \hline 12 \end{array}$$

A) 1) How much money is in the account at the start of the project? $144

2) How much money is withdrawn from the account each week? $12

3) Suppose the students continue withdrawing the same amount of money each week. Sketch a graph of this relationship.



4) Write an equation that represents this relationship. Explain what information each number and variable represents.

$y = \underline{-12}\,x + \underline{144}$

Let x = number of weeks

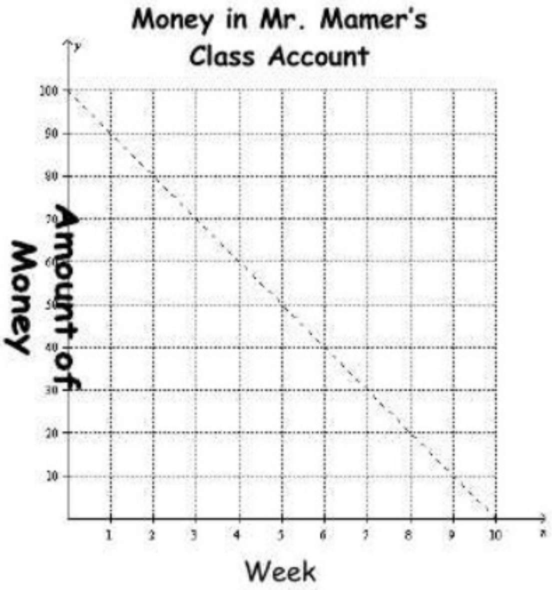
Let y = amount of money at the end of each week ($)

-12: They take $12 out the account each week.

144: The amount in the account at the start (week 0). is $144.

5) Is the relationship between the number of weeks and the amount of money left in the account a linear relationship? Explain.

Yes, it is linear
graph → straight line
table → constant rate of change.



B) 1) What information does the graph represent about the money in Mr. Mamer's class account?

The graph tells us how much money is in the account each week.

2) Make a table of data for the first 10 weeks. Explain why the table represents a linear relationship.

Weeks	0	1	2	3	4	5	6	7	8	9	10
Money in Account ($)	100	90	80	70	60	50	40	30	20	10	0

3) Write an equation that represents the linear relationship. Explain what information each number and variable represents.

$y = -10x + 100$

Let x = number of weeks
Let y = money in account (\$)
-10: \$10 taken out of the account per week
100: \$100 is what's in the account when they start (at week 0)

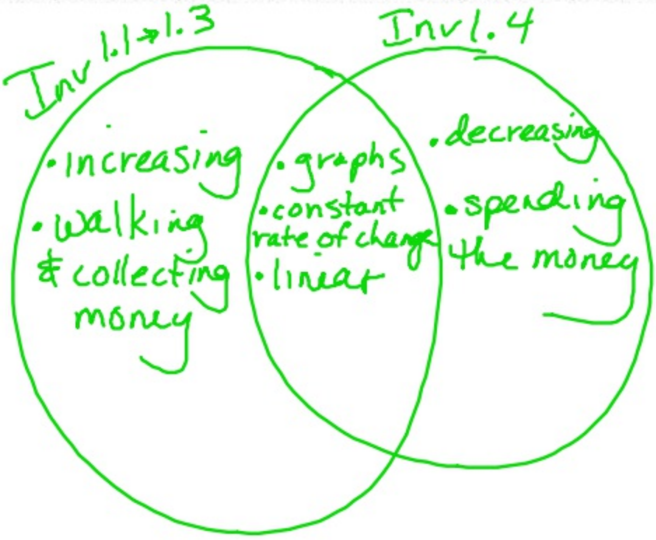
C) 1) How can you determine if a relationship is linear from…

a graph? It's a straight line

a table? It has a constant rate of change (skip count)

an equation? $y = \_x + \_$

2) Compare the linear relationships in this problem with those in previous problems in this investigation.



Inv 2.1

Inv 2.2

A) 1)

TIE

Emile

Time (sec)	0	5	10	15	20	25	30	35	40
Distance (m)	0	12.5	25	37.5	50	62.5	75	87.5	100

Henri

Time (sec)	0	5	10	15	20	25	30	35	40
Distance (m)	45	50	55	60	65	70	75	80	85

2) Graph

3) Emile: $y = 2.5x$

Henri: $y = x + 45$

Let x = time (s)

Let y = distance (m)

2.5 = Emile's walking rate (m/s)

45 = Henri's head start (45 m @ 0 s)

1 = Henri's walking rate (m/s)

0 = Emile's head start (0 m @ 0 s)

B) 1) How far does Emile walk in 20 seconds? 50 m

$y = 2.5x$
$y = \frac{2.5m}{s} \cdot 20s$
$y = 50m$

2) After 20 seconds, how far apart are the brothers?

Henri → 65m   65m − 50m = 15m

3) Is the point (26, 70) on either graph? Explain.

$y = x + 45$
$70 = 26 + 45$
$70 \neq 71$

This point is not on either line.

4) When will Emile overtake Henri? Explain.
Emile and Henri will tie at 30 seconds and 75 meters. After that Emile will be winning.

C) 1) How can you determine which of two lines will be steeper **from a table**?

The constant rate of change (skip count) will be higher in the table of the steeper line.

2) How can you determine which of two lines will be steeper **from an equation**?

The coefficient of x will be bigger

D) 1) At what points do Emile's and Henri's graphs cross the y-axis?

Emile: (0,0)

Henri: (0,45)

X=0.

2) What information do these points represent in terms of the race?

3) How can these points be found in **a table**?

How can these points be found in **an equation**?

Inv 2.3

"the change in"

$y = mx + b$

$m = \frac{\Delta y}{\Delta x} = \frac{rise}{run}$ → Slope

m	b
Slope	y-intercept → the point where the line crosses the y-axis
per	no matter what (starting amount when x=0)
Coefficient	constant
multiplied by x	added to x
Skipcount/Constant rate of change	y value when x=0
Steepness	beginning amount

$C_{MIGHTY} = 49 + n$ $\qquad$ $C_{NOSHRINK} = 4.5n$

A) 1) For each equation, explain what information the y-intercept and the coefficient(slope) of n represent.

$m = 1$ costs \$1 per shirt

$b = 49$ pay \$49 for 0 shirts (up front fee)

$m = 4.5$ costs \$4.50 per shirt

$b = 0$ \$0 up front fee

2) 12 T-shirts? $= n$

$C_M = 49 + n$
$C_M = 49 + 12$
$\boxed{C_M = \$61}$

$C_N = 4.5n$
$C_N = 4.5(12)$
$\boxed{C_N = \$54}$

20 T-shirts?

$C_M = 49 + n$
$= 49 + 20$
$= \boxed{\$69}$

$C_N = 4.5n$
$= 4.5(20)$
$= \boxed{\$90}$

3) Lani calculates that the school has about \$120 to spend on T-shirts. From which company will \$120 buy the most shirts? $C = \$120$

$C_M = 49 + n$
$120 = 49 + n$
$-49 \quad -49$
$\boxed{71 = n}$ shirts

$C_N = 4.5n$
$\frac{120}{4.5} = \frac{4.5n}{4.5}$
$26.\overline{6} = n$
$\boxed{26 \text{ shirts}}$

4) a) For what number of T-shirts is the cost of the two companies equal? What is the cost?

$C_M = 49 + 14$
$= \$63$

$C_N = 4.5(14)$
$= \boxed{\$63}$

$C_M = C_N$

$49 + n = 4.5n$
$-n \quad -n$

$\frac{49}{3.5} = \frac{3.5n}{3.5}$

$\boxed{n = 14 \text{ shirts}}$

b) How can this information be used to decide which plan to choose?

If they buy less than 14 shirts, they should buy from No Shrink. If more, they should buy from Mighty.

5) Explain why the relationship between the cost and the number of T-shirts for each company is a linear relationship.

They are linear because they have a constant rate of change. (you pay one price per shirt)

B) The table below represents the costs from another company, The Big T.

n	0	1	2	3	4	5	6	7	8	9	10
C	34	36.5	39	41.5	44	46.5	49	51.5	54	56.5	59

$m = \frac{\Delta y}{\Delta x} = \frac{5}{2} = 2.5$

1) Compare the costs for this company with the costs for the two companies in Question A.

\$2.50 per shirt
\$34 set up fee (cost for 0 shirts)

2) Does this plan represent a linear relationship? Explain.

This is linear because it has a constant rate of change.

3) a) Could the point (20, 84) lie on the graph of this cost plan? Explain.

$C_T = 2.5n + 34$
$84 = 2.5(20) + 34$
$84 = 50 + 34$
$84 = 84 \checkmark$

This point will be on the graph.