Chapter 1 Toolkits

Monday, August 23, 2021 11:09 AM

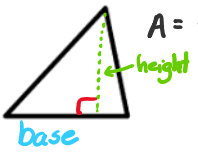
IM 2
Chapter 1...

Chapter 1 Toolkit

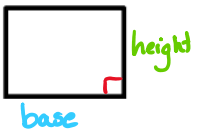
Name _____

Area Formulas

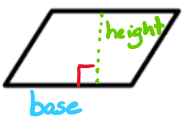
Triangle $A = \frac{1}{2}b \cdot h$ or $A = \frac{b \cdot h}{2}$



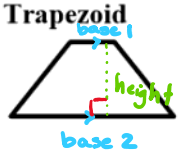
Rectangle $A = b \cdot h$



Parallelogram $A = b \cdot h$



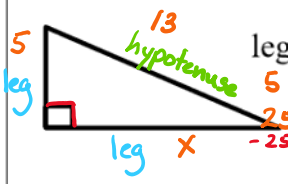
Trapezoid



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

Pythagorean Theorem

Used to find a missing side length in a RIGHT triangle or the distance between two points.



$leg^2 + leg^2 = hypotenuse^2$

$5^2 + x^2 = 13^2$

$25 + x^2 = 169$

$-25 \quad -25$

$\sqrt{x^2} = \sqrt{144}$

$x = 12$

Parallel and Perpendicular Lines

Slopes of parallel lines:

Slopes of perpendicular lines:

Graphing Lines

A situation that grows at a constant rate. The graph is a line.

$y = mx + b$ **m =** **b =**

Graph each of the following lines using the slope and y-intercept.

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

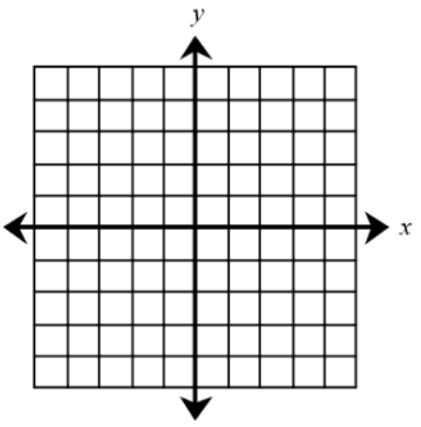
y-intercept:

slope:

$y = -3x + 5$

y-intercept:

slope:



Writing an Equation of a Line Given Two Points

Write the equation of the line that passes through the points (–4, 5) and (2, –4).

① Find slope (m)

② Substitute the slope into the equation $y = mx + b$

③ Substitute one of the points (x, y) into the equation from ② and solve for b.

④ Write final equation.

Laws Of Exponents

Base, Exponent, and Value

In the expression 2^5, 2 is the **base**, 5 is the **exponent**, and the **value** is 32.
2^5 means $2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = 32$ x^3 means $x \cdot x \cdot x$

Laws of Exponents

1) $x^a \cdot x^b = x^{a+b}$ examples: $x^3 \cdot x^4 =$; $2^7 \cdot 2^4 =$

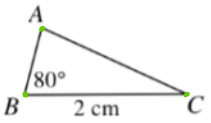
2) $\frac{x^a}{x^b} = x^{a-b}$ examples: $x^{10} \div x^4 =$; $\frac{2^4}{2^7} =$

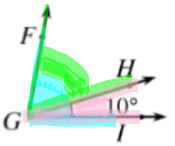
3) $(x^a)^b = x^{ab}$ examples: $(x^4)^3 =$; $(2x^3)^4 = 2^4 \cdot x^{12} =$

4) $x^{-a} = \frac{1}{x^a}$ and

$\frac{1}{x^{-b}} = x^b$ examples: $3x^{-3}y^2 =$; $\frac{2x^5}{y^{-2}} =$

Naming Parts of Geometric Figures (1.1.2)





Line - extends forever in both directions
$\overleftrightarrow{DE}$

Vertex - where 2 segments meet
The vertices are A, B, & C

Ray - part of a line, starts at a point, extends forever in one direction.
$\overrightarrow{GF}$ $\overrightarrow{GH}$ $\overrightarrow{GI}$

Line Segment - portion of a line
$\overline{DJ}$

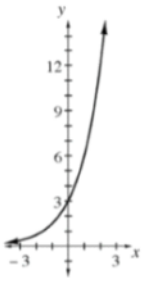
Angle - formed by 2 rays. Use 3 letters to name.

Naming an Angle
$\angle FGI$ $\angle FGH$ $\angle HGI$
$\angle IGF$ $\angle HGF$ $\angle IGH$

Exponential Models (1.2.3)

$y = ab^x$

x	y	
−2	0.75	
−1	1.5	× 2
0	3	× 2
1	6	× 2
2	12	× 2



a = b =

Describe Exponential Functions:

The cost of a large flat-screen television is decreasing 20% per year.

a. What is the multiplier?

b. If a 50-inch flat-screen now costs $1200, what will it cost in three years?

c. Using the same rate, what did it cost two years ago?

d. Write the equation of a function to model this situation.

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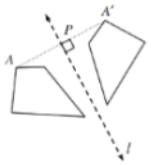
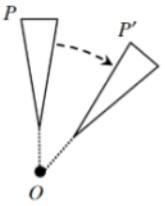
Rigid Transformations (1.2.4)

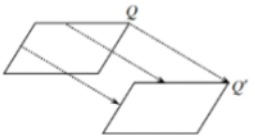
Reflection



Rotation



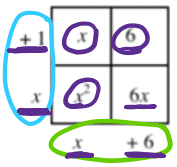
Translation



Prime Notation-

Using an Area Model for Multiplication (1.3.1)

To multiply $(x + 1)(x + 6)$ using an area model…

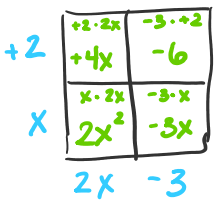


Area as a Product = Area as a Sum

$(x + 1)(x + 6) = x^2 + 6x + x + 6$

$= x^2 + 7x + 6$

Multiply $(x + 2)(2x - 3)$ using an area model.



$2x^2 - 3x + 4x - 6$

$2x^2 + x - 6$

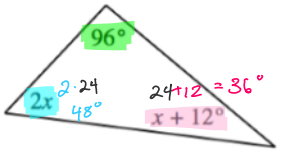
Conditional Statement (1-85)

A statement in "*If…,then…*" *form.*

Write an example of a conditional statement.

Triangle Angle Sum Theorem (1-104)

The sum of the angles of a triangle is 180°.



$2x + 96 + x + 12 = 180$

$3x + 108 = 180$

$-108 \quad -108$

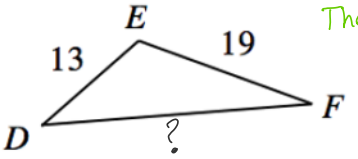
$\frac{3x}{3} = \frac{72}{3}$

$x = 24$

Triangle Inequality Theorem (1-105)

The third side < the sum of the other 2 sides

The third side > the DIFFERENCE of the other 2 sides



$19 - 13 < \overline{DF} < 13 + 19$

$6 < \overline{DF} < 32$

Angle Pair Relationships (1.3.4)

Complementary

2 angles whose measures have a sum of 90°

$x + y = 90°$

Supplementary

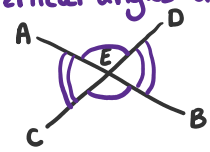
2 angles whose measures have a sum of 180°

$x + y = 180°$

linear pair

Vertical

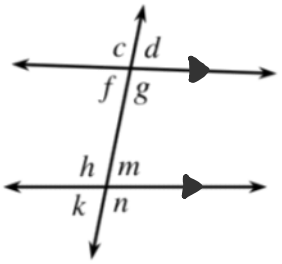
Vertical angles are congruent



$\angle AED \cong \angle CEB$ ($\angle BEC$)

$\angle AEC \cong \angle DEB$

Relationships with Transversals (1.3.4)



Same Side Interior Angles

If lines crossed by a transversal are parallel, then same side interior angles are SUPPLEMENTARY.

$\angle g + \angle m = 180°$

$\angle f + \angle h = 180°$

Exterior too!

$\angle c + \angle K = 180°$

$\angle d + \angle n = 180°$

|| lines → same side int. ∠s supp.

Corresponding Angles

If lines crossed by a transversal are parallel, then corresponding angles are CONGRUENT.

$\angle g \cong \angle n$

$\angle c \cong \angle h$

$\angle d \cong \angle m$

$\angle f \cong \angle K$

|| lines → corr. ∠s ≅

Alternate Interior Angles

If lines crossed by a transversal are parallel, then alternate interior angles are CONGRUENT.

$\angle f \cong \angle m$

$\angle g \cong \angle h$

Exterior too!

$\angle d \cong \angle K$

$\angle c \cong \angle n$

|| lines → alt. int. ∠s ≅