Part 4 Review of Exponents, Square Roots, Algebra, and Geometry

Unit 25

Exponents and Square Roots

Exponent

$2^3 = (2)(2)(2) = 8$

Base — Power

Whole Numbers

$3^2 = 3 \times 3 = 9$

$\sqrt{9} = 3$

☆ $3^0 = 1$

$3^1 = 3$

Fractions

$(\frac{1}{3})^2 = \frac{1}{3} \times \frac{1}{3} = \frac{1}{9}$

$\sqrt{\frac{1}{9}} = \frac{1}{3}$

Decimals

$(.2)^2 = .2 \times .2 = .04$

$\sqrt{.04} = .2$

Other Exponents

$2^5 = (2)(2)(2)(2)(2) = 32$

$\left(\frac{1}{5}\right)^3 = (\frac{1}{5})(\frac{1}{5})(\frac{1}{5}) = \frac{1}{125}$

$(.5)^3 = (.5)(.5)(.5) = .125$

☆ $3^{-1} = \frac{1}{3}$ ☆ $3^{-2} = \frac{1}{(3)(3)} = \frac{1}{9}$

Unit 26

Algebraic expressions

1. Algebraic expressions contain variables, numbers, and math operation signs.
2. Variables (letters) are used to represent unknown quantities.
3. Constants (numbers) represent known quantities.

Evaluating algebraic expressions

1. Replace all variables with their given values and do required math.
2. Evaluate $5x - y^2$ when x = 6 and y = 4.

$5x - y^2$

$= (5)(6) - 4^2$

$= 30 - 16 = 14$

Unit 26

Writing algebraic expressions and equations ☆

1. Represent the variables with letters.
2. Represent the constants with numbers.
3. State the required math operations.

4 increased by 3 times a number

$4 + 3x$

5 less than twice a number

$2x - 5$

3 Cokes cost $1.80.
Find the cost of 1 Coke.

x = the cost of 1 Coke.

$3x = \$1.80$

$\frac{3x}{3} = \frac{\$1.80}{3}$

$x = \$.60$

Unit 27

Solving Multi-Step Equations

1. An equation represents two equal expressions.
2. Opposite operations are required to isolate the variable and solve an equation.

Multi-Step Equations

$4x - 5 = 35$

$4x - 5 + 5 = 35 + 5$

$4x = 40$

$\frac{4x}{4} = \frac{40}{4}$

$x = 10$

Equations with Like Terms

$5y + 10 - 2y = 49$

$3y + 10 = 49$

$3y + 10 - 10 = 49 - 10$

$3y = 39$

$3y/3 = 39/3$

$y = 13$

Equations with Parentheses

$5(2x + 3) = 35$

$10x + 15 = 35$

$10x + 15 - 15 = 35 - 15$

$10x = 20$

$10x/10 = 20/10$

$x = 2$

Unit 28

Lines

Straight

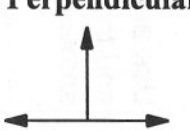
Horizontal

Vertical

Ray

Parallel

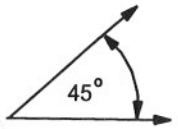
Perpendicular



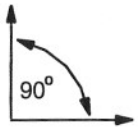
Unit 28

Angles are formed by two rays intersecting at a point (vertex).

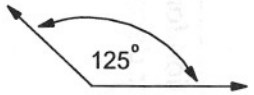
Acute



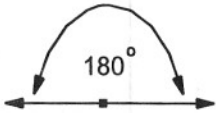
Right



Obtuse

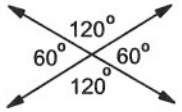


Straight

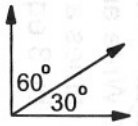


Reflex

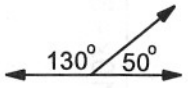
Vertical



Complementary



Supplementary

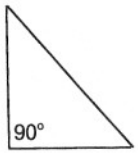


Unit 29

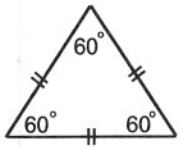
Triangles are three-sided polygons.

All angles total 180°.

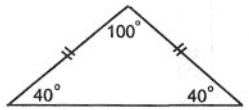
Right



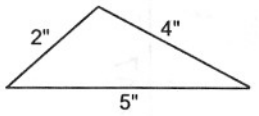
Equilateral and Equiangular



Isosceles



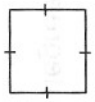
Scalene



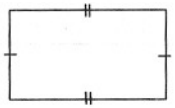
Unit 29

Quadrilaterals are four-sided polygons.

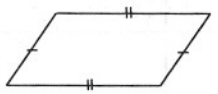
Squares



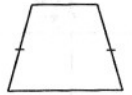
Rectangles



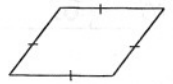
Parallelograms



Isosceles Trapezoid



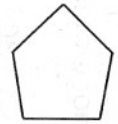
Rhombus



When all sides of a polygon are equal, it is called regular.

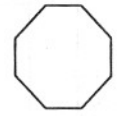
Other Interesting Polygons

Pentagon



Hexagon

Octagon



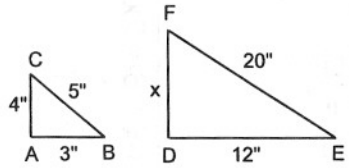
Unit 30 Similar Triangles

Similar Triangles (~) have the same shape.

1. They have corresponding angles that are equal.
2. They have corresponding sides that are in proportion.
3. If all three pairs of corresponding angles are equal (**AAA**), the triangles are similar.

$\Delta ABC \sim \Delta DEF$

$\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$



$\frac{AB}{DE} = \frac{AC}{DF}$

$\frac{3}{12} = \frac{4}{x}$

$3x = 48$

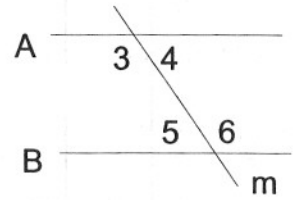
$DF = 16$

Unit 30 Congruent Triangles (≅) have both the same size and the same shape.

1. All corresponding parts are equal.
2. Triangles are congruent when:
   A. 2 sides and their included angle are equal (**SAS**).
   B. 2 angles and their included side are equal (**ASA**).
   C. 3 sides are equal (**SSS**).

Unit 30 Parallel Lines Cut by a Transversal

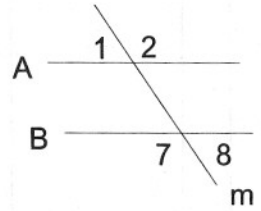
Alternate interior angles are equal.



$\angle 3 = \angle 6$

$\angle 4 = \angle 5$

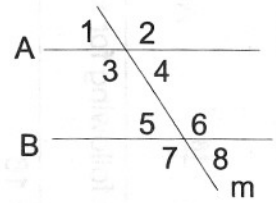
Alternate exterior angles are equal.



$\angle 1 = \angle 8$

$\angle 2 = \angle 7$

Corresponding angles are equal. They are on the same side of the transversal with one outside and one inside the parallel lines.



both on left	both on right
$\angle 1 = \angle 5$	$\angle 2 = \angle 6$
$\angle 3 = \angle 7$	$\angle 4 = \angle 8$