**BHS Geometry Summer Assignment**    Name: _____

**1. Solving Equations**

| a) $2x - 16 = 8$ | b) $2y - 3 + 5y = 9$ | c) $7x + 9 = 13x - 27$ |
|---|---|---|
| d) $-8w + 34 = 5w - 18$ | e) $3(5x + 10) = 180$ | f) $\frac{1}{2}(9x + 14) = 59$ |
| g) $3^2 + x^2 = 5^2$ | h) $x^2 - 14 = 16$ | i) $5y^2 + 18 = 63$ |

**2. Proportions and Fractions**:    Complete the Tables

| Fraction | Decimal | Percent |
|---|---|---|
| $\frac{4}{5}$ | | |
| | 1.05 | |
| | | 8% |

| Fraction | Decimal | Percent |
|---|---|---|
| | 0.015 | |
| $1\frac{7}{8}$ | | |
| $\frac{2}{3}$ | | |

**3. Solve Each Proportion**

| | |
|---|---|
| a) $\dfrac{5x}{7} = \dfrac{8}{9}$ | b) $\dfrac{2}{5} = \dfrac{3}{y}$ |
| c) $\dfrac{x-2}{4} = \dfrac{x+3}{6}$ | d) $\dfrac{2x-5}{6} = \dfrac{10}{3}$ |

**4. Simplify each of the following expressions**
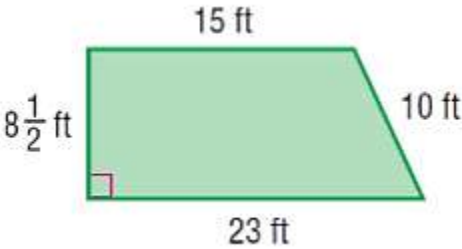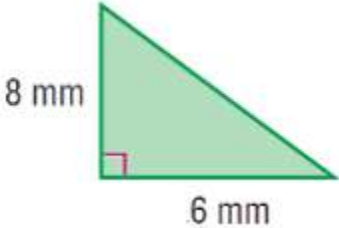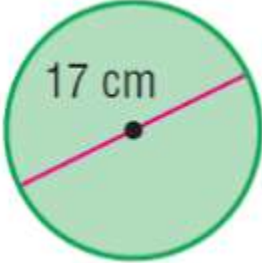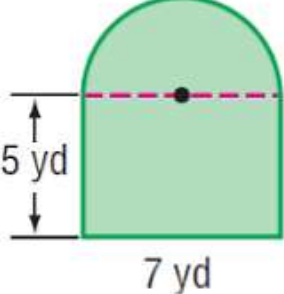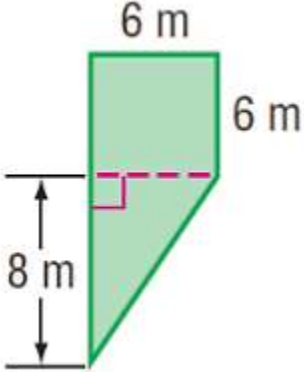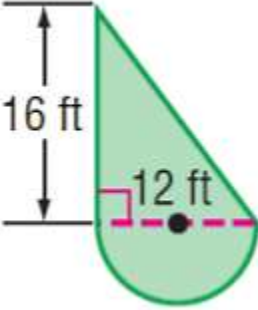
| | | |
|---|---|---|
| $-\sqrt{275}$ | $3\sqrt{12}$ | $\sqrt{\dfrac{36}{25}}$ |
| $2\sqrt{12} - 3\sqrt{75}$ | $\sqrt{3}(\sqrt{5} + \sqrt{3})$ | $(4a^2bc)(-2b^3c^2)$ |
| $4ab(3a^2 - 7b)$ | $(x-7)(x+7)$ | $(x+3)^2$ |
| $\dfrac{15x^4y^2z^5}{3x^2z^3}$ | $5(5+m) - 3(m-6)$ | $(6g-7)(6g+7)$ |

### 5. Area & Perimeter

Find the area and perimeter for each shape.  Label ALL units properly!

(leave answers for circles in terms of π or rounded to the nearest hundredths)
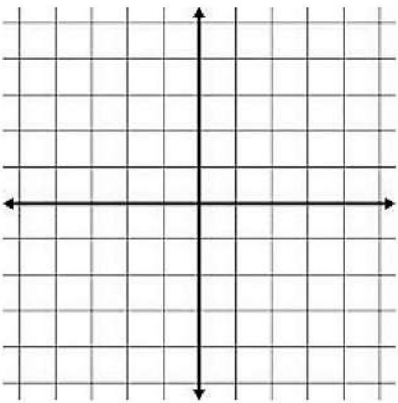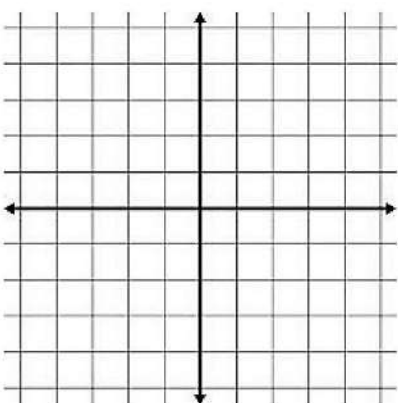
| | |
|---|---|
| a)<br><br>15 ft<br>$8\frac{1}{2}$ ft    10 ft<br>23 ft | b)<br><br>8 mm<br>6 mm |
| Area =                Perimeter = | Area =                Perimeter = |
| c)<br><br>17 cm | d)<br><br>5 yd<br>7 yd |
| Area =                Perimeter = | Area =                Perimeter = |
| e)<br><br>6 m<br>6 m<br>8 m | f)<br><br>16 ft<br>12 ft |
| Area =                Perimeter = | Area =                Perimeter = |

## 6. Linear Equations

Graph each line

| a)  $y = \frac{1}{2}x - 1$ | b)  $2x + 3y = 6$ |
|---|---|
| | |
| **List the slope and x and y-intercepts for the lines above.** | |
| m = _____<br><br>x-intercept = _____<br><br>y-intercept = _____ | m = _____<br><br>x-intercept = _____<br><br>y-intercept = _____ |

Find the slope of the line through each pair of points and write an equation for the line through them in point-slope form and slope-intercept form.

| coordinates | a)  $A\,(-5,3)\ B\,(1,-1)$ | b) $A\,(9,6)\ \ B\,(7,6)$ |
|---|---|---|
| slope | | |
| point-slope form<br>$y - y_1 = m(x - x_1)$ | | |
| slope-intercept form<br>$y = mx + b$ | | |

**7. Quadratics and Parabolas**
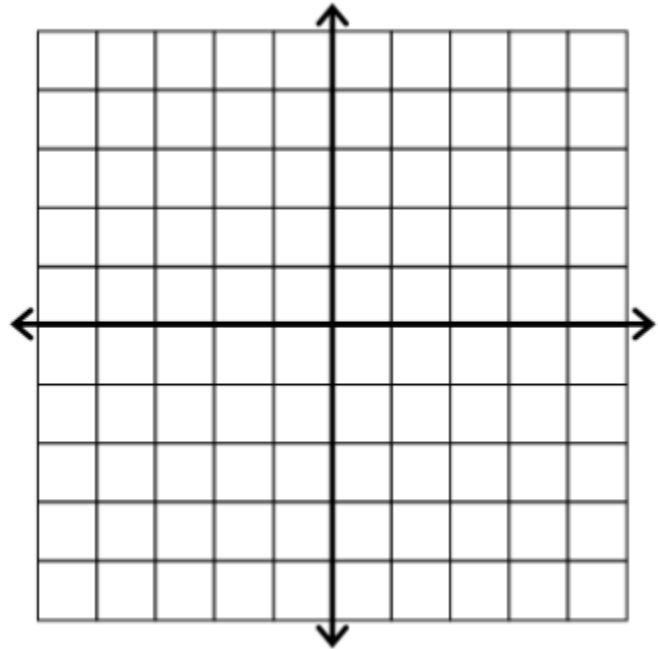
Graph the parabola  $y = x^2 - 2x - 3$

State each of the following:

Vertex $\left(\frac{-b}{2a}, y\right)$ _____

Axis of symmetry  x = _____

y-intercept _____

x-intercept (roots) _____

**8. Factor each of the following expressions**

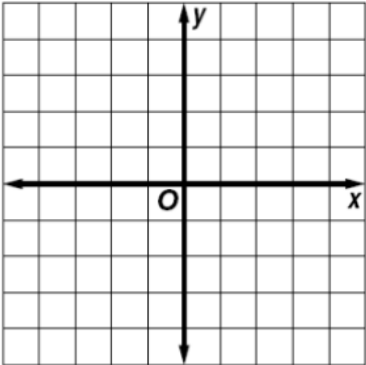| a)  $4x^2y - 10xy^2$ | b)  $30a^2b - 60ab^2 + 90a^2b^2$ |
|---|---|
| c)  $x^2 + 15x + 56$ | d)  $x^2 - 8x - 9$ |

Solve each equation

| e)  $(y - 5)(2y + 3) = 0$ | f)  $x^2 - 11x + 10 = 0$ |
|---|---|

**9. Solve each System of Equations**

| a) $y = 6x$ <br> $2x + 3y = -20$ | b) $2x - 4y = -22$ <br> $3x + 3y = 30$ |
|---|---|

c) Solve the system by graphing

$y = -3$

$2x - y = 1$

**10. Simplify each Expression**

| a) $5 + (-9) - 8 + (-4)$ | b) $-7 - -6$ | c) $8 - 29$ |
|---|---|---|
| d) $(-3) + (-4) + (9)$ | e) $-6(-4 + 3)$ | f) $23 + 2(-9 - 7)$ |
| g) $(-5)(3)(-1)(-4)$ | h) $-6^2 - 4(-3)^2$ | i) $7^2 - 8(2 - 9)$ |

Evaluate each of the following if $x = -5$, $y = 2$, $and$ $z = -3$.

| j) $xy - z$ | k) $x^2y + z^3$ |
|---|---|
| l) $x(yz - x^2)$ | m) $x + y + z - xyz$ |

**11. Simplify each Rational Expression**

https://www.youtube.com/watch?v=-YMVu5nFvzc

https://www.youtube.com/watch?v=Znm2F09whmY

| a) $\frac{3}{4} + \frac{5}{6} - \frac{2}{3}$ | b) $2\frac{1}{5} - 4\frac{1}{3}$ | c) $\frac{3}{4}(5 + 1\frac{1}{2})$ |
|---|---|---|
| d) $\frac{1}{4} * \frac{4}{5}$ | e) $\frac{3}{4} \div \frac{5}{6}$ | f) $1\frac{2}{3} \div \frac{5}{6}$ |
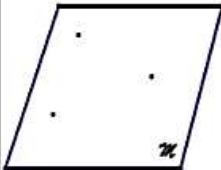
Evaluate if $a = \frac{1}{3}$, $b = 2.5$, $and$ $c = \frac{4}{7}$

| g) $a(b + c)$ | h) $a - b \div c$ |
|---|---|

**GEOMETRY REVIEW/PREVIEW (REFERENCE SHEETS)**

You should know the following vocabulary from previous math classes. Please review the terms and definitions.

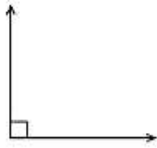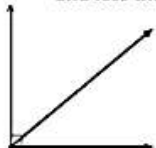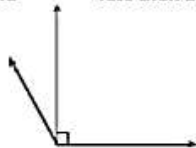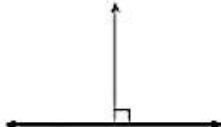The three undetermined terms in geometry are: point, line and plane. These are also called the "Building Blocks of Geometry" because everything is based on these 3 ideas. We are able to describe them but not able to define them.

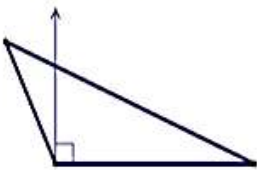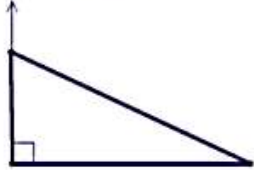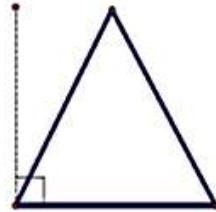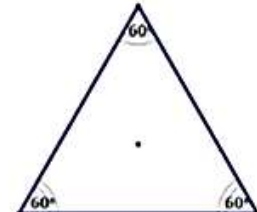| Vocabulary Term | Description/Definition | Diagram | Symbol Explanation | Symbol |
|---|---|---|---|---|
| Point | A **point** is the basic unit in geometry. It has no size – infinitely small. It represents locations. Use a dot to represent a point. | • | Name a point by using a capital printed letter. | A |
| Line | A **line** is a straight arrangement of points – it is made up of an infinite number of points. It extends infinitely in two directions but has no thickness. | | Name a line by using 2 points that are on the line and putting ↔ above these 2 letters. The letters may be in any order. | $\overleftrightarrow{AB}$ $\overleftrightarrow{BA}$ |
| Line Segment | A **line segment** consists of 2 points and all the points between them that lie on the line containing them. | | Name a line by using 2 points that are on the line and putting ▬ above the 2 letters. The letters may be in any order. | $\overline{PQ}$ $\overline{QP}$ |
| Ray | A **ray** is a part of a line. It contains one endpoint and all of the points on that line to one side of it. | | Always name a ray by two points. First name the endpoint, then name the point that it goes through. Put a ray symbol above the letters: → Note: the ray symbol always faces to the right, no matter which way the ray is facing. | $\overrightarrow{QP}$ |
| Plane | A **plane** has length and width but no thickness – it is a flat surface that extends indefinitely. | | Name a plane by either 3 points that are on the plane or a capital script letter that can be found in the corner of the plane. Note: you may not name a plane with 3 points that are all on the same line. | ▱CDE ▱CED ▱DEC ▱DCE ▱EDC ▱ECD plane 𝓜 𝓜 |

- Angles

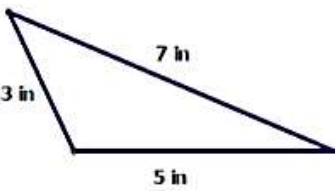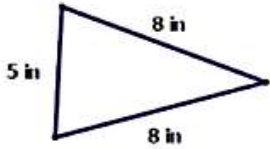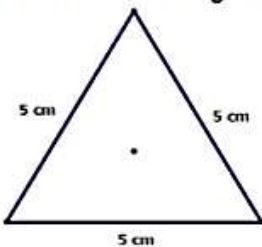| Right Angle: measures exactly 90° | Acute Angle: Measures more than 0° and less than 90° | Obtuse Angle: Measures more than 90° and less than 180° | "Straight Angle": Measures 180° |
|---|---|---|---|
|  |  |  |  |

- Polygons

| # of Sides | Name |
|---|---|
| 3 | Triangle |
| 4 | Quadrilateral |
| 5 | Pentagon |
| 6 | Hexagon |

| # of Sides | Name |
|---|---|
| 7 | Septagon |
| 8 | Octagon |
| 9 | Nonagon |
| 10 | Decagon |
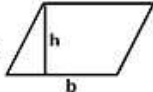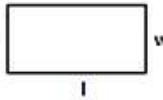
- There are special kinds of triangles. Triangles may be classified by their angle measures.

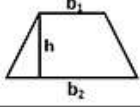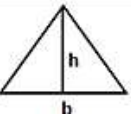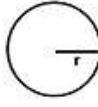| Obtuse Triangle: has one obtuse angle and two acute angles | Right Triangle: has one right angle and two acute angles | Acute Triangle: has three acute angles | Equiangular Triangle: special kind of acute triangle, all 3 angles measure 60° |
|---|---|---|---|
|  |  |  |  |

Triangles may also be classified by their side lengths.

| Scalene Triangle: no sides are the same length | Isosceles Triangle: at least two sides are the same length | Equilateral Triangle: all three sides are the same length |
|---|---|---|
|  |  |  |

| Shape | | Formula | Shape | | Formula |
|---|---|---|---|---|---|
| Square |  | $A = l \times l = l^2$ | Parallelogram |  | $A = h \times b$ |
| Rectangle |  | $A = l \times w$ | Trapezoid |  | $A = 1/2 \times h \times (b_1 + b_2)$ |
| Triangle |  | $A = 1/2 \times b \times h$ | Circle |  | $A = \pi \times r^2$ ($\pi = 3.14$ or $22/7$) |