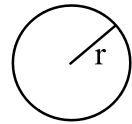**Circle:** A **circle** is defined completely in terms of its **radius**. A **circle** is the set of points in a plane which are at a **constant distance** from a central point. This **constant distance** is called the **radius** of the circle.

Diameter: The **diameter** of a circle is the maximum straight line distance across the circle and is given by twice the radius: $\boxed{d = 2r}$.

Circumference: The **perimeter** of a **circle** is called its **circumference**, and is given by the formula: $\boxed{C = 2\pi r}$ where r and π are as above.

Circle Area: The **area of a circle** is given by the formula (**memorize**): $\boxed{A = \pi r^2}$ where r is the radius of the circle and $\pi = 3.1415926\ldots$ is a mathematical constant.

Volume: The amount of **solid** space occupied by an object.

Sphere: A **sphere** (ball) is defined completely in terms of its **radius**. A **sphere** is the set of points in space which are at a **constant distance** from a central point. This **constant distance** is called the **radius** of the sphere.

Sphere Surface Area: The **surface area** of a **sphere** is given by the formula (**memorize**): $\boxed{A = 4\pi r^2}$ where r is the radius of the sphere.

Sphere Volume: The **volume** of a **sphere** is given by the formula (**memorize**): $\boxed{V = \frac{4}{3}\pi r^3}$ where r is the radius of the sphere.

Rectangular Block: A **rectangular block** is a solid in which all faces meet at **90°** angles.
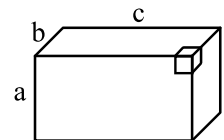
Rectangular Block Volume: The **volume** of a **rectangular block** is given by the formula (**memorize**): $\boxed{V = abc}$ where a, b, and c are the edge lengths of the block.

**Cube:** A **cube** is a rectangular block where all the **edges** are the **same length**.

Cone: A **cone** is a solid rising linearly to a point (**apex**) with a circular or elliptical **base**.

Pyramid: A **pyramid** is a solid rising linearly to a point (**apex**) with a polygonal **base**.

Pyramid or Cone Volume: (**memorize**) $\boxed{V = \frac{1}{3}Bh}$ where B is the area of the **base** (grey in the figures above) and h is the **vertical** height.

Cylinder: A **cylinder** is a solid with the **same horizontal cross section** at any vertical point.
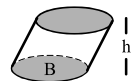
Cylinder Volume: (**memorize**) $\boxed{V = Bh}$ where B is the area of the **base** and h is the **vertical** height.

Geometry 2 Homework Problems
(NO CALCULATORS)

SIMPLIFY

a) $\left[\left(x^{-1}\right)^{-2}\right]^{-3}$

b) $\dfrac{\sqrt{a} \bullet a^{-2/3}}{\sqrt[6]{a^5}} + \dfrac{a^{-5/6}}{\sqrt[3]{a^2} \bullet a^{-1/2}}$

c) $x^{5.7} x^{-1.35} x^{0.61} / x^{1.73}$

### RATIONALIZE THE DENOMINATOR AND REDUCE TO SIMPLEST FORM

d) $\dfrac{\sqrt{2}+\sqrt{3}+\sqrt{6}}{\sqrt{2}+\sqrt{3}}$

e) $\dfrac{2+\sqrt{3}+\sqrt{5}}{2+\sqrt{3}-\sqrt{5}}$

f) $\sqrt{\dfrac{x-y}{x^3 y - 2x^2 y^2 + xy^3}}$

g) A circle has perimeter 44. What is its radius to the nearest whole number?

h) A cylinder has a square base of side 10 and is 12 high. What is its volume?

i) What is the surface area of a cube 5 cm on a side?

j) In terms of π what is the surface area of a sphere of diameter 22 ?

k) A pyramid has a square base of side 10 and is 12 high. What is its volume?

l) A shed is a cube of side 10 with a conical roof of height 9. What is its volume?

m) What is the units digit of 389^{27} .

n) The area of the shaded region is what fractional part of the total area?
Each of the triangles is equilateral.
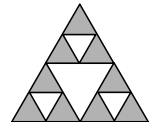
o) In the square shown, each curve is the arc of a circle with radius 4, having centers at opposite vertices of the square of side 4. Find the number of square units in the area of the football (oval) shaped portion of the figure. Express your answer in terms of π.
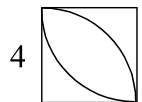
p) How many units apart is any pair of parallel sides of a regular hexagon with a side of 6 units? Express your answer in simplest radical form?

q) Amy's horse van holds 6 horses. Using her van, what is the minimum number of trips Amy will have to make to move 25 horses?

r) How many prime numbers less than 100 are divisible by 11 or 13 or 17 or 19 ?

s) Find the length of side AB. Express your answer in simplest radical form.
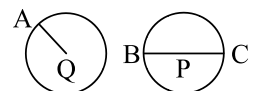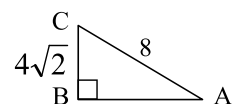
t) Given QA = 5 and BC = 4, what is the ratio of the area of circle P to the area of circle Q? Express your answer as a common fraction.

u) A 3 x 5 photograph is enlarged to 5 x 7 size. What is the percent increase in area? Express the answer as a mixed numeral.

v) Find the number of units in the perimeter of the isosceles triangle ABC.
AC = 8 and BD = 12.
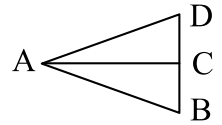
w) What is the smallest composite number whose prime factorization contains a number other than 2, 3, 5, or 7 ?

x) What is the smallest positive integer that is a multiple of 8, 12, and 20 and is larger than the least common multiple of 24, 40 and 60 ?

y) The surface of a 4 x 4 x 4 cube is painted red, and is then cut into 64 1 x 1 x 1 cubes. How many of the small cubes have exactly one red face?

z) What percent of 20 is 66 ?