Geometry Placement Test
Answer Key

I

1. cosine
2. obtuse
3. arc
4. complementary
5. plane
6. trapezoid
7. cube
8. collinear
9. congruent
10. perimeter

II

1. trapezoid
2. $\angle 12$
3. $m\angle 6 = m\angle 8 = 60°$
   corresponding angles
4. $m\angle 5 = 180° - (m\angle 4 + m\angle 6) =$
   $180° - (60° + 90°) =$
   $180° - 150° = 30°$
5. $\triangle BDC$ is a $30°-60°-90°$ triangle
   hypotenuse = 8 in
   $\overline{BD}$ (short leg) $= 8 \div 2 = 4$ in
   $\overline{BC}$ (long leg) $= 4\sqrt{3}$
6. $m\angle 14 = 180° - m\angle 5 =$
   $180° - 30° = 150°$
7. no, line EC is not parallel to line AC
8. point E
9. Let X = length of $\overline{AE}$
   $\frac{20}{8} = \frac{X}{4}$
   $8X = (4)(20)$
   $8X = 80$
   $X = 10$
10. First find length of $\overline{AC}$:
    $\triangle EAC$ is a $30°-60°-90°$ triangle,
    so the long leg is $\sqrt{3}$ times
    the short leg or $10\sqrt{3}$
    $AB = AC - BC = 10\sqrt{3} - 4\sqrt{3} = 6\sqrt{3}$

III

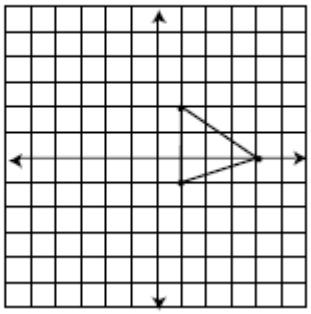
1.

$\overline{CE} \cong \overline{CA}$	given
$\angle ABC \cong \angle CDE$	given
$\angle ACB \cong \angle DCE$	vertical angles
$\triangle ABC \cong \triangle CDE$	AAS

2.

$\overline{AB} \cong \overline{BC}$	given
$\angle BEC$ is a right angle	given
$\angle BEA$ is a right angle	supplementary
$\overline{BE} \cong \overline{BE}$	reflexive property
$\triangle ABE \cong \triangle CBE$	HL
$\overline{AE} \cong \overline{CE}$	CPCTRC

IV.



V

$V = \frac{4}{3}\pi r^3 \approx \frac{4}{3}(3.14)(3^3)$

$= 113.04 \text{ cm}^3$

If the fractional value of π is used, the answer would be 113.14 cm^3.

VI

$SA = 2(2)(5) + 2(2)(7) + 2(5)(7) =$
$20 + 28 + 70 = 118 \text{ cm}^2$

VII

$360°$ total of all angles
$360° \div 45° = 8$ sides; octagon

VIII

1. $(3\sqrt{2})(4\sqrt{22}) = (3)(4)\sqrt{2}\sqrt{22} = 12\sqrt{44} = 12\sqrt{4}\sqrt{11} = 12(2)\sqrt{11} = 24\sqrt{11}$
2. $\frac{4}{\sqrt{3}} - \frac{2\sqrt{6}}{\sqrt{2}} = \frac{4\sqrt{3}}{\sqrt{3}\sqrt{3}} - \frac{2\sqrt{3}}{1} = \frac{4\sqrt{3}}{\sqrt{9}} - \frac{2\sqrt{3}}{1} = \frac{4\sqrt{3}}{3} - \frac{2\sqrt{3}}{1} = \frac{4\sqrt{3}}{3} - \frac{2\sqrt{3}(3)}{1(3)} = \frac{4\sqrt{3}}{3} - \frac{6\sqrt{3}}{3} = \frac{4\sqrt{3} - 6\sqrt{3}}{3} = \frac{-2\sqrt{3}}{3}$
3. $-3\sqrt{5} + \sqrt{5} = (-3+1)\sqrt{5} = -2\sqrt{5}$
4. $\sqrt{2} + \sqrt{3} + \sqrt{4} + \sqrt{1} = \sqrt{2} + \sqrt{3} + 2 + 1 = \sqrt{2} + \sqrt{3} + 3$

IX

$C = \pi d \Rightarrow 8\pi = \pi d$

$\frac{8\pi}{\pi} = \frac{\pi d}{\pi}$

$8 = d$

$\text{radius} = \left(\frac{1}{2}\right)8 = 4$

X

Check with ruler:
smaller segments should each measure 2 inches.

XI

The measure of a central angle is equal to the measure of the arc it intercepts.
$m\angle AXC = 98°$
The measure of an inscribed angle is half the measure of the arc it intercepts.
$m\angle ABC = 98° \div 2 = 49°$

XII

$L^2 + 2^2 = 5^2$

$L^2 + 4 = 25$

$L^2 = 21$

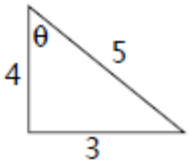
$L = \sqrt{21}$

XIII

Start by drawing a diagram.

Sine is $\frac{3}{5} = \frac{\text{opposite}}{\text{hypotenuse}}$

so we know that the hypotenuse is 5, and one leg is 3.



$L^2 + 3^2 = 5^2$

$L^2 + 9 = 25$

$L^2 = 16$

$L = 4$ so other leg is 4

$\sin\theta = \frac{3}{5}$ $\quad \csc\theta = \frac{5}{3}$

$\cos\theta = \frac{4}{5}$ $\quad \sec\theta = \frac{5}{4}$

$\tan\theta = \frac{3}{4}$ $\quad \cot\theta = \frac{4}{3}$