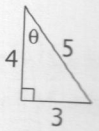
10. B: translation of 5 spaces
11. C: rotation of 90° around the origin
12. A: R
13. E: none
14. D: V; Each point on figure Q has been to the left 5 and up 2.
15. B: S; Q has been translated and rotated, so its transformation includes rotation.

Test 29

1. A: triangles
2. C: right
3. D: cosine
4. A: tangent
5. E: none of the above
6. B: $\frac{B}{C}$
7. B: $\frac{A}{B}$
8. E: $\frac{A}{C}$
9. A: $\frac{5\sqrt{3}}{10} = \frac{\sqrt{3}}{2}$
10. A: $\frac{5\sqrt{3}}{10} = \frac{\sqrt{3}}{2}$
11. D: $\frac{5}{5\sqrt{3}} = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{\sqrt{3}\sqrt{3}} = \frac{\sqrt{3}}{\sqrt{9}} = \frac{\sqrt{3}}{3}$
12. C: 30°
13. C: $\frac{4}{5}$
14. A: $\frac{3}{5}$
15. B: $\frac{3}{4}$

Test 30

1. B: cosecant
2. D: secant
3. B: cotangent
4. E: none of the above: it is the cotangent
5. A: secant
6. C: cosecant
7. D: $\frac{C}{A}$
8. B: $\frac{A}{C}$



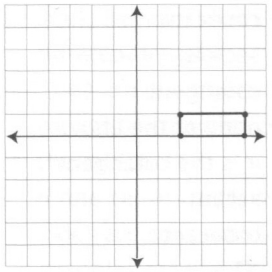
9. A: $\frac{C}{A}$
10. C: $\frac{2\sqrt{3}}{2} = \frac{\sqrt{3}}{1} = \sqrt{3}$
11. E: $\frac{4}{2} = 2$
12. B: $\frac{4}{2} = 2$
13. D: $\sin^2\theta + \cos^2\theta = 1$
14. E: $\frac{4\sqrt{2}}{4} = \frac{\sqrt{2}}{1} = \sqrt{2}$
15. C: $\frac{4}{4} = 1$

Unit Test III

I

1. axiom or postulate
2. dilation
3. reflection
4. tangent
5. secant
6. similar
7. sphere
8. cotangent

II



III

1. $L = 4\sqrt{3}$; $H = 2(4) = 8$
2. $L = 2\sqrt{3}$; $H = 2\sqrt{3}\sqrt{2} = 2\sqrt{6}$
3. both legs $= \frac{6\sqrt{2}}{\sqrt{2}} = \frac{6}{1} = 6$
4. short leg $= \frac{10}{2} = 5$

   long leg $= 5\sqrt{3}$

IV Find length of hypotenuse:

$$4^2 + 5^2 = H^2$$
$$16 + 25 = H^2$$
$$41 = H^2$$
$$\sqrt{41} = H$$

1. $\sin\theta = \frac{4}{\sqrt{41}} = \frac{4\sqrt{41}}{\sqrt{41}\sqrt{41}} = \frac{4\sqrt{41}}{41}$
2. $\cos\theta = \frac{5}{\sqrt{41}} = \frac{5\sqrt{41}}{\sqrt{41}\sqrt{41}} = \frac{5\sqrt{41}}{41}$
3. $\tan\theta = \frac{4}{5}$
4. $\csc\theta = \frac{\sqrt{41}}{4}$
5. $\sec\theta = \frac{\sqrt{41}}{5}$
6. $\cot\theta = \frac{5}{4}$

V
$$(X+4)+(2X+6)+(-5X) = 12$$
$$X+2X+(-5X)+4+6 = 12$$
$$-2X+10 = 12$$
$$-2X = 2$$
$$X = -1$$

$X+4 \quad (-1)+4 = 3$

$2X+6 \quad 2(-1)+6 = -2+6 = 4$

$-5X \quad -5(-1) = 5$

Sides are 3, 4 and 5.

$3^2 + 4^2 = 5^2$

$9+16 = 25$

$25 = 25$: true

Since the Pythagorean theorem applies, this is a right triangle.

VI Please note: The proofs given here may not be the only valid options. As long as each statement is based on given information, valid postulates, definitions and theorems, or on statements made previously within the proof, the student's proof can be considered correct.

1.

$\overline{AC}$ bisects $\angle BAD$	given
$\angle BCA \cong \angle DCA$	given
$\angle BAC \cong \angle DAC$	a bisector divides the angle into equal parts
$\overline{AC} \cong \overline{AC}$	reflexive property
$\angle BCA$ is a right angle	given
$\angle DCA$ is a right angle	supplementary angles
$\triangle BAC \cong \triangle DAC$	LA

2.

$\overline{BD} \parallel \overline{CE}$	given
$\angle ABD \cong \angle ACE$	corresponding angles
$\angle BAD \cong \angle CAE$	reflexive property
$\triangle ACE \sim \triangle ABD$	AA

3.

$m\angle ADC = m\angle BCD = 90°$	definition of a rectangle
$\overline{DC} \cong \overline{DC}$	reflexive property
$\overline{AD} \cong \overline{BC}$	opposite sides of a rectangle are congruent (APT)
$\triangle ADC \cong \triangle BCD$	SAS or LL

Final Exam

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

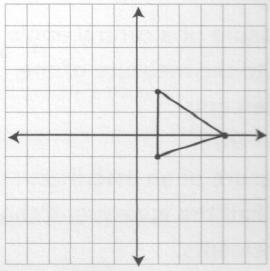
1.

$\overline{CE} \cong \overline{CA}$	given
$\angle B \cong \angle D$	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.