Trig Test #1 Review

#1 a) Using the top triangle: $AC^2 = 4^2 + 5^2 - 2(4)(5)\cos x$

$AC^2 = 41 - 40\cos x$

$AC = \sqrt{41 - 40\cos x}$

b) $\frac{\sin 30^\circ}{4} = \frac{\sin x^\circ}{AC}$

$AC \sin 30^\circ = 4 \sin x^\circ$

$AC = \frac{4 \sin x^\circ}{\sin 30^\circ}$

~~c) $\sqrt{41 - 40\cos x} = \frac{4 \sin x^\circ}{\sin 30^\circ}$~~

~~c) Graph each side & find intersection on calculator.~~

~~$x \approx 8.68$~~

~~d) $AC = \sqrt{41 - 40\cos(8.68)}$.~~

#2 a) $A = \frac{1}{2} ab \sin C$

$20 = \frac{1}{2}(5)(13.6)\sin C$

$C = 36.0^\circ$

b) $c^2 = 5^2 + 13.6^2 - 2(5)(13.6)\cos 36^\circ$

$c = 10$

#3 a) $13^2 = 7^2 + 7^2 - 2(7)(7)\cos C$

$169 = 98 - 98\cos C$

$\frac{71}{-98} = \frac{-98\cos C}{-98}$

$\angle ACB = 136^\circ$

b) $\angle ACD = 180 - 136^\circ = 44^\circ$

$\frac{\sin 44^\circ}{6.5} = \frac{\sin D^\circ}{7}$

$D = 48.4^\circ$

So $\angle CAD = 180 - (44 + 48.4)$

$= 87.6^\circ$

#4 a) $\frac{\sin 75^\circ}{10} = \frac{\sin R}{7}$

$R = 42.5^\circ$

$75^\circ + 42.5^\circ + P = 180$

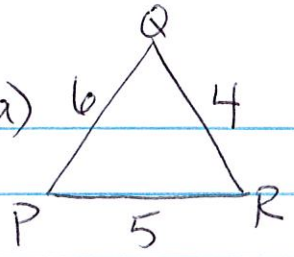
$\angle QPR = 62.5^\circ$

b) $A = \frac{1}{2}(a)(b)\sin C$

$A = \frac{1}{2}(7)(10)\sin 62.5^\circ$

$A = 31\ cm^2$

#5 a)



$5^2 = 4^2 + 6^2 - 2(4)(6)\cos Q$

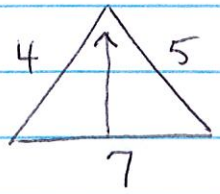
$25 = 52 - 48\cos Q$

$\frac{-27}{-48} = \frac{-48\cos Q}{-48}$

$Q = 55.8^\circ$

b) Area $= \frac{1}{2}(6)(4)\sin 55.8^\circ = 9.92\ cm^2$

#6



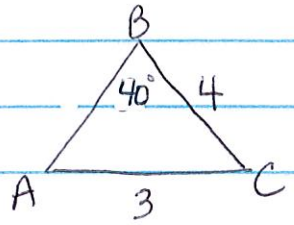
$7^2 = 4^2 + 5^2 - 2(4)(5)\cos\theta$

$49 = 41 - 40\cos\theta$

$\frac{8}{-40} = \frac{-40\cos\theta}{-40}$

$\theta = 102^\circ$ (3 sig figs)

#7



$\frac{\sin 40^\circ}{3} = \frac{\sin A}{4}$

$A = 59^\circ$ or 121°

#8 a) $AD^2 = 7.1^2 + 9.2^2 - 2(7.1)(9.2)\cos 60^\circ$

$AD = 8.35\ cm$

b) $\frac{\sin 110^\circ}{8.35} = \frac{\sin 18^\circ}{DE}$

$DE = 2.75\ cm$

c) $5.68 = \frac{1}{2}(7.1)(3.2)\sin B$

$B = 30^\circ$

d) $AC^2 = 9.2^2 + 3.2^2 - 2(9.2)(3.2)\cos 90^\circ$

$AC = 9.74\ cm$

e) $\frac{1}{2}(9.2)(7.1)\sin 60^\circ + 5.68 = 34\ cm^2$

9. $\frac{4}{3}\pi = \frac{1}{2}\theta r^2$ $\quad \frac{2}{3}\pi = \theta r$ $\quad \frac{8\pi}{3r^2} = \frac{2\pi}{3r}$

$\frac{8\pi}{3r^2} = \theta$ $\quad \frac{2\pi}{3r} = \theta$ $\quad 24r\pi = 6\pi r^2$

$0 = 6\pi r^2 - 24r\pi$

$0 = 6\pi r(r-4)$

$r = 0, 4$ $\quad \theta = \frac{\pi}{6}$

↑ not possible

#10 $24 = \theta r$ $\quad 180 = \frac{1}{2}\theta r^2$

$\frac{24}{r} = \theta$ $\quad \frac{360}{r^2} = \theta$

$\frac{24}{r} = \frac{360}{r^2}$

$24r^2 = 360r$

$24r^2 - 360r = 0$

$24r(r-15) = 0$

$r = 0$ or 15 $\quad \theta = \frac{24}{15} = \frac{8}{5}$ or 1.6

↑ not possible

#11 a) $27 = \frac{1}{2}(1.5)r^2$

$r = 6$

b) $l = (1.5)(6)$

$l = 9\text{ cm}$

#12 $21.6 = \frac{1}{2}\theta(5.4)^2$

$\theta = 1.48$

$l = \theta r$

$l = (1.48)(5.4)$

$l = 8\text{ cm}$

#13 Shaded area = (area of sector) − (area of right Δ)

$= \frac{1}{2}(.8)(5)^2 - \frac{1}{2}(5)(3.59)\sin(.77)$

$= 3.75\ cm^2$

#14 a) $\ell = 2(15) = 30\ cm$

b) $A = \frac{1}{2}(2\pi - 2)(15)^2 = 482\ cm^2$

#15 a) $A = \frac{1}{2}(2)(15)^2 = 225\ cm^2$

b) (Area of Sector) − (area of triangle)

$225 - \frac{1}{2}(15)(15)\sin 2 = 123\ cm^2$

#16 a) 7

b) $\binom{6}{r}(x^3)^{6-r}(-3x)^r$

$\binom{6}{r}x^{18-3r}(-3)^r x^r$

$\binom{6}{r}(-3)^r x^{18-2r} = \_\_ x^{12}$

$18 - 2r = 12$

$r = 3$

$\binom{6}{3}(-3)^3 = -540$

c) $18 - 2r = 0$

$r = 9$ ← not possible

$\binom{6}{9}$ isn't possible

#17 a) 6

b) $\binom{5}{r}(x^2)^{5-r}(-2)^r = Ax^4$

$\binom{5}{r}(-2)^r x^{10-2r} = Ax^4$

$10 - 2r = 4$

$r = 3$

$\binom{5}{3}(-2)^3 = A = -80$