HA2T *Semester 2 Review* Name: Key

1. Transform to simple radical form $\dfrac{1+\frac{2}{\sqrt{2}}}{1-\frac{2}{\sqrt{2}}}\cdot\dfrac{\sqrt{2}}{\sqrt{2}} = \dfrac{\sqrt{2}+2}{\sqrt{2}-2}\cdot\dfrac{\sqrt{2}+2}{\sqrt{2}+2} =$

$\dfrac{2+4\sqrt{2}+4}{2-4} = \dfrac{6+4\sqrt{2}}{-2} = \boxed{-3-2\sqrt{2}}$

2. Solve: $x+5=\sqrt{x+5}+6$

$x-1=\sqrt{x+5}$

$\boxed{x=4,-1}$

$x^2-2x+1=x+5$

$x^2-3x-4=0$

$(x-4)(x+1)=0$

Transform the equation and sketch. Find and label the center, vertices, endpoints, foci, x-radius and y-radius.

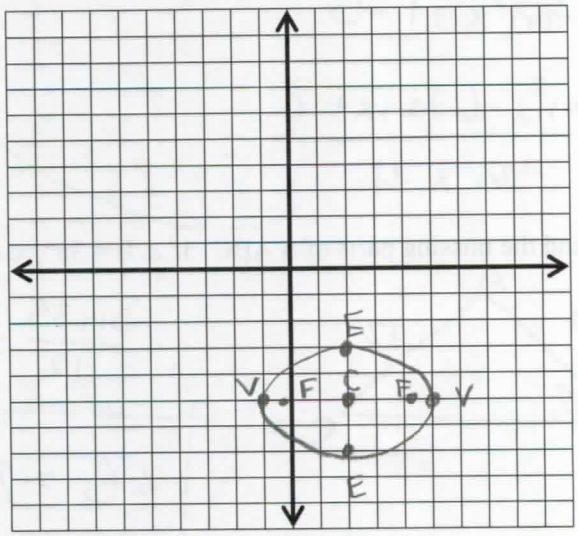
3. $4x^2+9y^2-16x+90y+205=0$

$4x^2-16x+9y^2+90y=-205$

$4(x^2-4x\ \ )+9(y^2+10y\ \ )=-205$
$\quad +4 \qquad\quad +25 \qquad\quad +16 \quad +225$

$4(x-2)^2+9(y+5)^2=36$

$\dfrac{(x-2)^2}{9}+\dfrac{(y+5)^2}{4}=1$



$C(2,-5)$

$E(2,-3)(2,-7)$

$V(5,-5)(-1,-5)$

$F(2\pm\sqrt{5},-5)$

Find all of the zeros.

4. $f(x)=x^3-7x^2+11x+3$

$\pm1,\pm3$

$3\ |\ 1\ \ -7\ \ 11\ \ 3$
$\quad\ \downarrow\ \ 3\ \ -12\ \ -3$
$\quad\ \ 1\ -4\ \ -1\ \ 0$

x^2-4x-1

Zeros: $3,\ 2\pm\sqrt{5}$

Q.F. $x=\dfrac{4\pm\sqrt{16-4(1)(-1)}}{2}$

$\dfrac{4\pm\sqrt{20}}{2}=\dfrac{4\pm2\sqrt{5}}{2}=$

5. Expand $(a+2)^4$

$1a^4 + 4a^3 \cdot 2 + 6a^2 \cdot 2^2 + 4a \cdot 2^3 + 1 \cdot 2^4$

$a^4 + 8a^3 + 24a^2 + 32a + 16$

6. Find the term with y^{18} for $(x - y^3)^{12}$

$\frac{12!}{6!6!}(x)^6(-y^3)^6$

$= 924x^6y^{18}$

7. Given A terminates in QII and $\sin A = \frac{5}{13}$, find $\cos 2A$.

$1 - 2\sin^2 A$

$1 - 2\left(\frac{5}{13}\right)^2$

$1 - \frac{50}{169} = \frac{119}{169}$

8. Prove the identity: $\frac{\sec^2 x - 6\tan x + 7}{\sec^2 x - 5} = \frac{\tan x - 4}{\tan x + 2}$

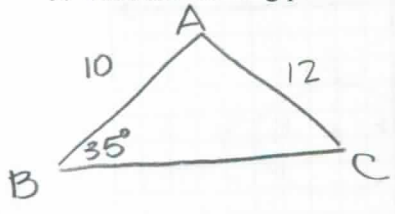
$\frac{\tan^2 x + 1 - 6\tan x + 7}{\tan^2 x + 1 - 5} =$

$\frac{\tan^2 x - 6\tan x + 8}{\tan^2 x - 4} =$

$\frac{(\tan x - 4)(\tan x - 2)}{(\tan x + 2)(\tan x - 2)} =$

$\frac{\tan x - 4}{\tan x + 2} = \frac{\tan x - 4}{\tan x + 2}$ ✓

9. Find the missing parts of ΔABC if $\angle B = 35°$, $c = 10$, and $b = 12$.



$\frac{\sin 35}{12} = \frac{\sin C}{10}$

$\angle C = 28.55°$

10. Find the area of a triangle with sides of length $a = 4$, $b = 5$, and $c = 6$.

$A = \sqrt{7.5(3.5)(2.5)(1.5)}$

$= 9.92$