Name_____

(8 pts)   1.   Find $5a - 4b$ if $a = \langle 4, -2 \rangle$ and $b = \langle 2, -3 \rangle$.

        A. $\langle 28, 1 \rangle$

        B. $\langle 12, -22 \rangle$

        C. $\langle 28, -22 \rangle$

        D. $\langle 12, 2 \rangle$

        E.   None of these

(8 pts)   2.   Find the vertex of the parabola $x = y^2 - 6y + 7$.

        A. $(-2, 3)$

        B. $(3, -2)$

        C. $(2, -3)$

        D. $(-3, 2)$

        E.   None of these

(8 pts)   3.   Write the trigonometric form for $4 + 8i$.

        A. $2\sqrt{3}\left[\cos\left(\arctan 2\right) + i\sin\left(\arctan 2\right)\right]$

        B. $4\sqrt{5}\ \cos\ \arctan\dfrac{1}{2}\ + i\sin\ \arctan\dfrac{1}{2}$

        C. $4\sqrt{5}\left[\cos\left(\arctan 2\right) + i\sin\left(\arctan 2\right)\right]$

        D. $2\sqrt{3}\ \cos\ \arctan\dfrac{1}{2}\ + i\sin\ \arctan\dfrac{1}{2}$

        E. None of these.

1

Name_____

(12 pts) 4. Find the magnitude of $a = \langle -4\sqrt{3}, 4 \rangle$ and the smallest positive angle from the positive x-axis to the vector.

Magnitude =

=

(16 pts) 5. Find the equations of the horizontal and vertical asymptotes and find the x- and y-intercepts for the graph of $f(x) = \dfrac{x-4}{x^2 - x - 2}$.

Horizontal:

Vertical:

x-intercept(s):

y-intercept(s):

(12 pts) 6. A parabola has vertex V($-3, 5$), axis parallel to the y-axis, and passes through the point ($3, 1$). Express the equation of the parabola in the form $y = ax^2 + bx + c$.

y =

Name_____

(10 pts)   7.   Calculate the angle between the vectors $a = \langle 5, -2 \rangle$ and $b = \langle -3, 4 \rangle$ to the nearest degree.

Angle =

(14 pts)   8.   A woman is exerting a force of 40 pounds to push a cart up an incline that makes an angle of 35^0 with the horizontal, as shown in the figure. Find the work done in pushing the cart 90 feet. Round your answer to tenths.

Work =

Name_____

(12 pts)   9.   An airplane is flying with a velocity in the direction 170^0 and a magnitude of
380 mph. A wind is blowing with a velocity in the direction 50^0 and a magnitude of
30 mph. Find the ground speed, that is, find the magnitude of the resultant velocity.
(Draw and label a sketch, set up an equation(s) and solve.) Round your answer to tenths.

Ground Speed =