Student: _____	Instructor: Joe Betters	
Date: _____	Course: Pre-Calculus Pre AP (Master Course)	Assignment: 9.4 Classwork Day 1

1. The vector **v** has initial point P and terminal point Q. Write **v** in the form a**i** + b**j**; that is, find its position vector.

   $P = (-3, -5);$ $Q = (9, -9)$

   What is the position vector?

   ○ $-12i + 4j$ ○ $-4i + 12j$

   ○ $4i - 12j$ ○ $12i - 4j$

   ID: 9.4.31

2. Find $\|v - w\|$, if $v = -6i + 2j$ and $w = -5i + 6j$.

   $\|v - w\| =$ _____
   (Type an exact answer, using radicals as needed. Simplify your answer.)

   ID: 9.4.43

3. Find a vector **v** whose magnitude is 9 and whose component in the **i** direction is twice the component in the **j** direction.

   One vector that satisfies the given conditions is **v** = _____ .
   (Simplify your answer. Type an exact answer using radicals as needed. Type your answer in the form a**i** + b**j**. Use integers or fractions for any numbers in the expression.)

   ID: 9.4.53

4. Write the vector **v** in the form a**i** + b**j**, given its magnitude is $\|v\| = 10$ and the angle it makes with the positive x-axis is $\alpha = 120°$.

   v = _____ **i** + _____ **j**
   (Simplify your answer, including any radicals. Use integers or fractions for any numbers in the expression.)

   ID: 9.4.61

5. Find the direction angle of **v** for the following vector.

   $v = -6i - 4j$

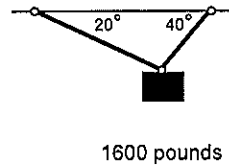   What is the direction angle of **v**?

   _____ °

   (Round to one decimal place as needed.)

   ID: 9.4.69

6. A weight of 1600 pounds is suspended from two cables as shown in the figure. What is the tension in the two cables?

1600 pounds

What is the tension in the left cable?

_____ pounds
(Round to one decimal place as needed.)

What is the tension in the right cable?

_____ pounds
(Round to one decimal place as needed.)

ID: 9.4.85

1. $12i - 4j$

2. $\sqrt{17}$

3. $\dfrac{18\sqrt{5}}{5}i + \dfrac{9\sqrt{5}}{5}j$

4. -5

   $5\sqrt{3}$

5. 213.7

6. 1415.3

   1736.1

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① $P = (-3, -5)$

$Q = (9, -9)$

~~~~~~~~~~~~~~~~~~~~~~~~~~

$V = \langle x_2 - x_1, y_2 - y_1 \rangle$

$= \langle 9 - (-3), -9 - (-5) \rangle$

$= \langle 12, -4 \rangle$

$= \boxed{12i - 4j}$

② $V = -6i + 2j$

$W = -5i + 6j$

Find $\|V - W\|$

$\| -i - 4j \|$

$\left(\sqrt{(-1)^2 + (-4)^2} \right) = \boxed{\sqrt{17}}$

③ vector magnitude of 9
and $a = 2b$

$$\|v\| = \sqrt{a^2 + b^2} = \sqrt{(2b)^2 + b^2} = \sqrt{5b^2}$$

$$\sqrt{5b^2} = 9$$

$$b = \pm \frac{9\sqrt{5}}{5}$$

$$a = 2b$$

$$a = 2\left(\pm \frac{9\sqrt{5}}{5}\right)$$

$$a = \pm \frac{18\sqrt{5}}{5}$$

$$\boxed{\frac{18\sqrt{5}}{5}i + \frac{9\sqrt{5}}{5}j}$$

other answers
can work as
well

④ $\|v\| = 10$

$\alpha = 120°$

$$v = \|v\| \left(\cos\alpha\, i + \sin\alpha\, j \right)$$

$$= 10 \left(\cos 120\, i + \sin 120\, j \right)$$

$$= 10 \left(-\tfrac{1}{2}\, i + \frac{\sqrt{3}}{2}\, j \right)$$
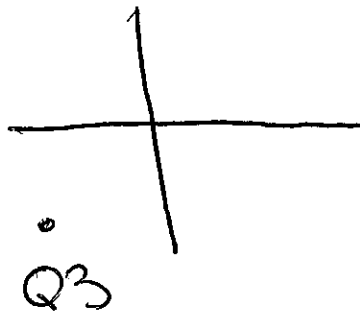
$$= \boxed{-5i + 5\sqrt{3}\, j}$$
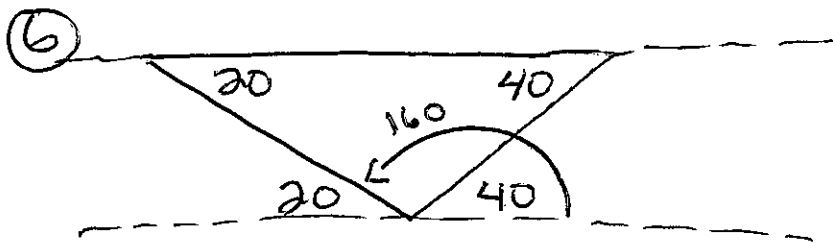
9.4 classwork continued

⑤ $V = -6i - 4j$

$\tan \theta = \dfrac{-4}{-6}$

$\theta = 33.7°$

$180 + 33.7 = \boxed{213.7°}$

Q3

9.4 classwork continued

⑥

$$F_1 = \|F_1\| \left(\cos 160 \, i + \sin 160 \, j \right)$$

$$F_1 = \|F_1\| \left(-.9397 \, i + .3420 \, j \right)$$

$$F_2 = \|F_2\| \left(\cos 40 \, i + \sin 40 \, j \right)$$

$$F_2 = \|F_2\| \left(.7660 \, i + .6428 \, j \right)$$

$$F_3 = -1600 \, j$$

$$\left(-.9397 \|F_1\| + .7660 \|F_2\| \right) i = 0$$

$$\left(.3420 \|F_1\| + .6428 \|F_2\| - 1600 \right) j = 0$$

$$-.9397 \|F_1\| + .7660 \|F_2\| = 0$$

$$.3420 \|F_1\| + .6428 \|F_2\| - 1600 = 0$$

* Solve *

$$F_1 = 1415.3$$

$$F_2 = 1736.1$$