Pre Calc class work week 26, One problem per team. 15 minutes per problem

12. Beth runs a 10 mile race for charity. Contributors give money based on how far she runs. Everyone contributes \$3 and a dollar for every mile she runs up to 5 miles. For every mile over 5 she runs, contributors will pay an extra \$2 a mile. Write the piecewise function that describes this situation.

a) $f(x)=\begin{cases}3+x, x\le 5\\ 8+2x, 5<x\le 10\end{cases}$

b) $f(x)=\begin{cases}3+x, x\le 5\\ 8+2(x-5), 5<x\le 10\end{cases}$

c) $f(x)=\begin{cases}3+x, x\le 5\\ 2(x-5), 5<x\le 10\end{cases}$

d) $f(x)=\begin{cases}3+x, x\le 5\\ 8+2(10-x), 5<x\le 10\end{cases}$

13. In the problem above, what is the maximum amount a contributor can pay Beth (she finishes the race) ?

a) \$10 b) \$23 c) \$28 d) \$18

14. $f(x)=|6+8x|$ is equivalent to which piecewise function below?

a) $f(x)=\begin{cases}6+8x, x\ge -\frac{3}{4}\\ -8x-6, x<-\frac{3}{4}\end{cases}$

b) $f(x)=\begin{cases}6+8x, x\le -\frac{3}{4}\\ -8x-6, x>-\frac{3}{4}\end{cases}$

c) $f(x)=\begin{cases}6+8x, x\le -\frac{3}{4}\\ 6-8x, x>-\frac{3}{4}\end{cases}$

d) $f(x)=\begin{cases}6+8x, x\ge -\frac{3}{4}\\ 6-8x, x<-\frac{3}{4}\end{cases}$

Total 5 points

7 Question 7 (No Calculator)

Use the vectors below to answer question 7

$\mathbf{u} = -2\mathbf{i} + 13\mathbf{j} + 7\mathbf{k}$ $\mathbf{v} = -5\mathbf{i} - 6\mathbf{j} + 2\mathbf{k}$ $\mathbf{w} = 3\mathbf{i} - 7\mathbf{j} - 8\mathbf{k}$

Evaluate each expression:

7.1 $\mathbf{u} \times \mathbf{w}$ {5}

7.2 $\mathbf{w} \cdot (\mathbf{u} \times \mathbf{v})$ {5}

Total 10 points

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8 Question 8 (No Calculator)

8.1 Transform the equation 5xy = 12 from rectangular coordinates to polar coordinates. Simplify your answer using double angles and leave answer in sine function. {6}

8.2 Plot the point P with polar coordinates $(-3, \frac{5\pi}{6})$ and find other polar coordinate (r, θ) for the same point P for which $r > 0$, $and\ 0 \le \theta \le 2\pi$. {4}

Total 10 points