

First Name: _____

Last Name: _____

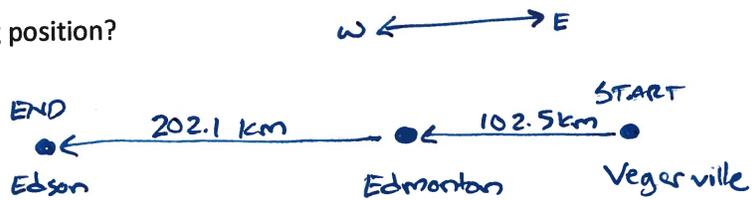
102 - EQ - Distance, Position, Displacement, and Velocity

Use the following information to answer Q1- Q3:

Jill drives straight from Vegreville to Edson. Vegreville is 102.5 km [East] of Edmonton, while Edson is 202.1 km [West] of Edmonton.

Q1: Which best describes Jill's starting position?

- a. 99.6 km [West]
- b. 102.5 km [East]
- c. 202.1 km [West]
- d. 304.6 km [West]



Q2: Which best describes Jill's final position?

- a. 99.6 km [West]
- b. 102.5 km [East]
- c. 202.1 km [West]
- d. 304.6 km [West]

Q3: Which best describes Jill's displacement?

- a. 99.6 km [West]
- b. 102.5 km [East]
- c. 202.1 km [West]
- d. 304.6 km [West]

Don't care about initial position.

KEY

Use the following information to answer Q4 - Q5:

A hyper child is 8m [North] of a swing set. He runs 14m [South], 6m [North], 12m [South], and then 25m [North]

d_4

Q4: How much distance did the child run?

(Record your three digit answer in the Numerical Response boxes below)

5 7 . 0

$$\begin{aligned} d_{\text{tot}} &= d_1 + d_2 + d_3 + d_4 \\ &= 14\text{m} + 6\text{m} + 12\text{m} + 25\text{m} \\ &= 57\text{m} \\ &= 57.0\text{m} \end{aligned}$$

Scalar, don't care about direction.

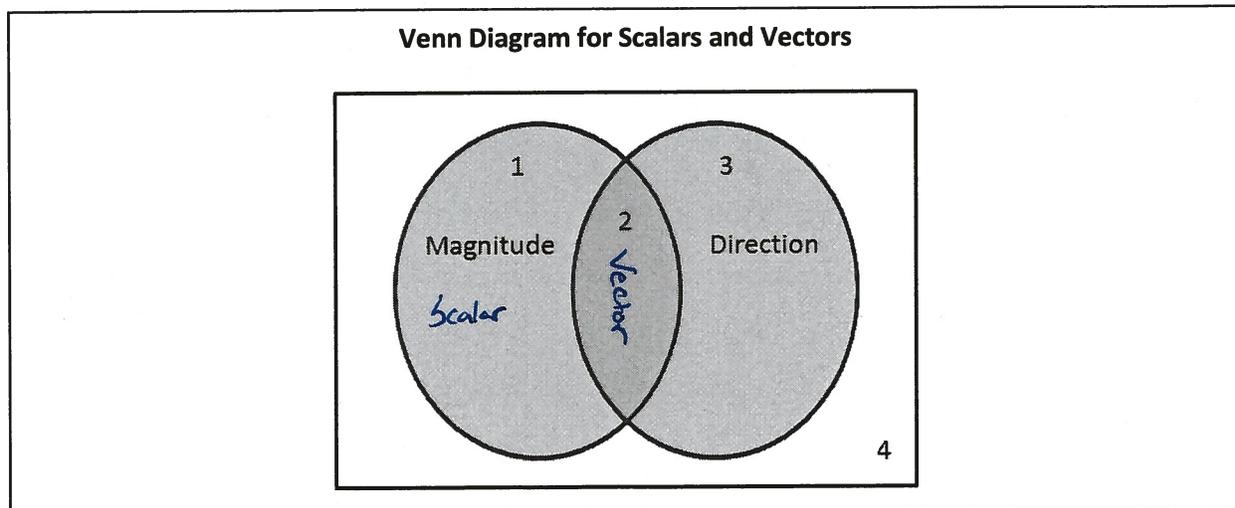
Q5: What is the magnitude of the child's displacement?

(Record your three digit answer in the Numerical Response boxes below)

5 . 0 0

$$\begin{aligned} \Delta \vec{d}_{\text{tot}} &= \Delta \vec{d}_1 + \Delta \vec{d}_2 + \Delta \vec{d}_3 + \Delta \vec{d}_4 \\ &= 14\text{m}[S] + 6\text{m}[N] + 12\text{m}[S] + 25\text{m}[N] \\ &= -14 + 6 - 12 + 25 \\ &= 5\text{m}[N] \quad \text{or} \quad \underbrace{5.00\text{m}}_{\text{mag}} \underbrace{[N]}_{\text{Dir}} \end{aligned}$$

Use the following information to answer Q6:



Q6: Match the numbers of the regions in the Venn diagram with the descriptions given below.

Region: 1 2 1 2
 Description: Time Position Distance Displacement

(Record your four digit answer in the Numerical Response boxes below)

1 2 1 2

KEY

Use the following information to answer Q7-Q10:

A hyper dog starts 5m [East] of a fire hydrant. He runs 10m [East], 3m [West], then 5m [East]. After running for 5 seconds, he is exhausted and lays down to rest.

Q7: The dog's total distance travelled is ____m.

- a. 7m
- b. 17m
- c. 18m
- d. 23m

$$\begin{aligned}
 d_{\text{TOT}} &= d_1 + d_2 + d_3 \\
 &= 10\text{m} + 3\text{m} + 5\text{m} \\
 &= 18\text{m}
 \end{aligned}$$

Q8: The dog's total displacement is ____m [East].

(Record your 3-digit answer in the Numerical Response boxes below)

1	2	.	0
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$$\begin{aligned}
 \Delta \vec{d}_{\text{TOT}} &= \Delta \vec{d}_1 + \Delta \vec{d}_2 + \Delta \vec{d}_3 \\
 &= 10\text{m}[E] + 3\text{m}[W] + 5\text{m}[E] \\
 &= 10\text{m}[E] - 3\text{m}[E] + 5\text{m}[E] \\
 &= 12\text{m}[E] \\
 &= 12.0\text{ m}[E]
 \end{aligned}$$

Q9: The dog's final position is *a.bc* x 10^d m [East] of the fire hydrant.

(Record your 3-digit answer in the Numerical Response boxes below)

1	7	0	1
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$$\begin{aligned}
 \Delta \vec{d} &= \vec{d}_f - \vec{d}_i \\
 12\text{m}[E] &= \vec{d}_f - 5\text{m}[E] \\
 +5 & \qquad \qquad +5 \\
 17\text{m}[E] &= \vec{d}_f \\
 \vec{d}_f &= 1.70 \times 10^1 \text{ m}[E]
 \end{aligned}$$

Q10: What is the dog's velocity?

(Record your 3-digit answer in the Numerical Response boxes below)

2	.	4	0
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$$\vec{v} = \frac{\Delta \vec{d}}{\Delta t} = \frac{12\text{m}[E]}{5\text{s}} = 2.40\text{ m/s}[E]$$

■ KEY ■

MARKING:

Beginning	0.0 – 4.5
Progressing	5.0 – 6.5
Competent	7.0 – 8.5
Exemplary	9.0 – 10.0
