① $d = (+23) + (-35.7) + (+17) + (-6) = -4.7$ Km

4.7 Km [S]

② $\Delta d = d_f - d_i$

$= (-30) - (+100) =$ **-130 cm**

③ a) $d = (+3.27) + (+2.00) + (-7.95) + (+2.34) + (-4.56) + (+4.90)$

$d = 0$

b) maximum displacement = point where you are farthest from the origin. Find this by doing a running total.

$(+3.27) + (2.00) = +5.27$ m ← maximum

$(+5.27) + (-7.95) = -2.68$ m

$(-2.68) + (2.34) = -0.34$ m

$(-0.34) + (-4.56) = -4.90$ m

$(-4.90) + (+4.90) = 0$ ← minimum

maximum = **+5.27 m**

c) minimum = **0**

④ $d_1 + d_2 = 3.79$ $\qquad$ $d_2 + d_3 = -7.82$

$d_1 = 3.79 - d_2$ $\qquad$ $d_3 = -7.82 - d_2$

$d_1 + d_2 + d_3 = 1.27$

$(3.79 - d_2) + d_2 + (-7.82 - d_2) = 1.27$

$-4.03 - d_2 = 1.27$

$-d_2 = 5.3$

$d_2 = \boxed{-5.3 \text{ Km}}$

$d_1 = 3.79 - d_2$ $\qquad$ $d_3 = -7.82 - d_2$

$= 3.79 - (-5.3)$ $\qquad$ $= -7.82 - (-5.3)$

$d_1 = \boxed{9.09 \text{ Km}}$ $\qquad$ $d_3 = \boxed{-2.52 \text{ Km}}$

⑤ $96 \text{ Km/h} \div 3.6 = \boxed{26.\overline{6} \text{ m/s}}$

⑥ $v_{avg} = \frac{d}{t}$

$= \frac{157 \text{ Km}}{2.45 \text{ h}} = \boxed{64.1 \text{ Km/h}}$

⑦ $v = \frac{d}{t}$ $\qquad$ $d = vt$

$= (95)(3.5) = \boxed{332.5 \text{ Km}}$

⑧ $v = \frac{d}{t}$

$t = \frac{d}{v}$

$= \frac{260 \text{ Km}}{104 \text{ Km/h}} = 2.5 \text{ h}$

Since the drive takes 2.5h, you have **1.0 h** to stop for lunch.

⑨ $d = v \cdot t$

$= (3 \times 10^8)(251) = 753\,000\,000 \text{ m}$

$7.53 \times 10^8 \text{ m}$

⑩ a) Change in speed $= 136 - 128 =$ **8 Km/h**

b) $\Delta v = v_f - v_i$

$= (+136) - (-128)$

$= +264$

264 Km/h [E]

⑪ a) disp. $= (-78) + (+93) = +15 \text{ Km}$

$v = \frac{d}{t}$

$= \frac{15}{1.22} =$ **12.3 Km/h [N]**

(11) b) dist = 78 + 93 = 171 Km

$v = \frac{d}{t}$

$= \frac{171}{1.22} = 140.2$ Km/h

(12) Child 1: $d = vt$

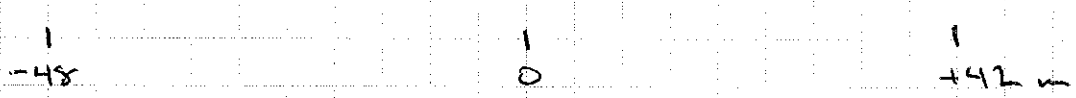
$= (3.5)(12)$

$d_1 = +42$ m

Child 2: $d_2 = vt$

$= (-4)(12)$

$= -48$ m



They are $48 + 42 =$ **90 m** apart

(13) $v_i = 90$ Km/h $\div 3.6 = 25$ m/s

$a = \frac{\Delta v}{t}$

$= \frac{v_f - v_i}{t}$

$-2 = \frac{v_f - 25}{5}$

$-10 = v_f - 25$

$v_f = -10 + 25$

$v_f =$ **+15 m/s**

(14) $a = \frac{\Delta v}{t}$

$= \frac{v_f - v_i}{t}$

$= \frac{26.8 - 0}{4}$

$a = \boxed{6.7 \text{ m/s}^2}$