Physics 1   2017-09-26

Agenda: — questions.

— exam

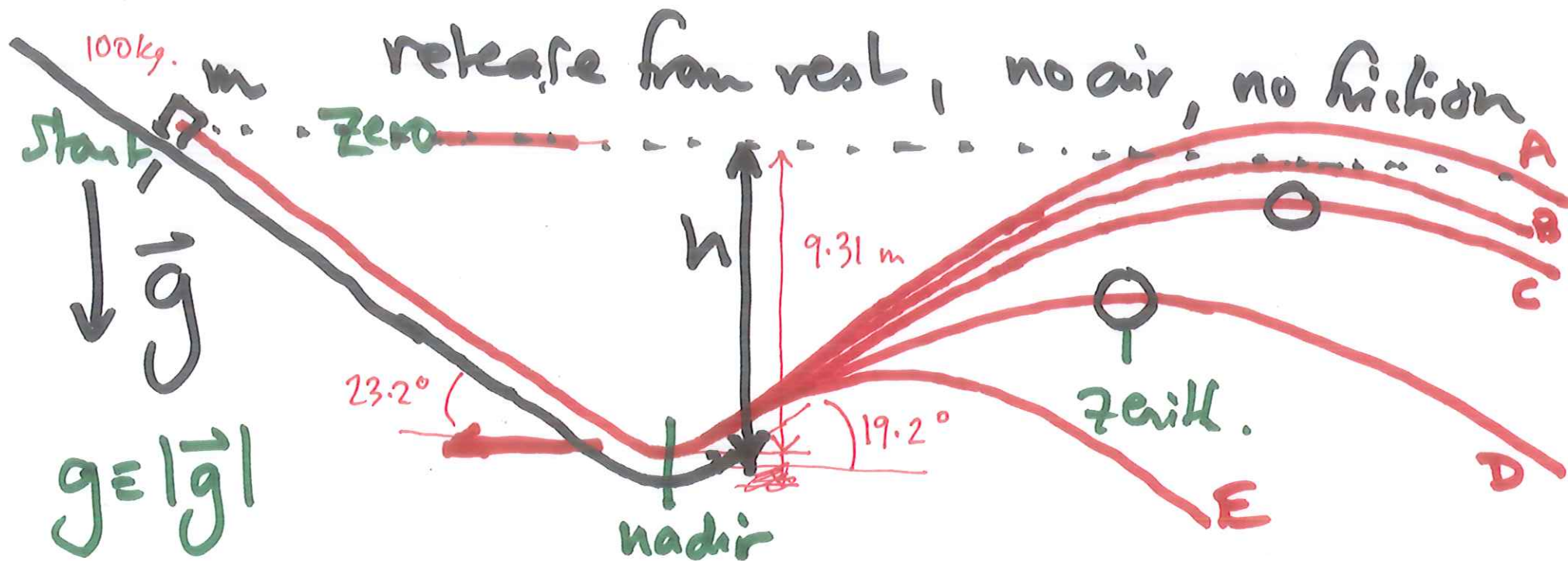— ski jump.

— reading { energy
kinetic
potential.
(& N's laws...)

release from rest, no air, no friction

100 kg. m

Start

zero

$\vec{g}$

$g \equiv |\vec{g}|$

$h \equiv |\vec{h}|$

h

9.31 m

23.2°

19.2°

zenith.

nadir

A

B

C

D

E

A - 0   0   Mechanical Energy

B - 41   2   Kinetic energy $\frac{1}{2}mv^2$

C - 16   13   +

D - 7   13   Potential energy

E - God.   mgh

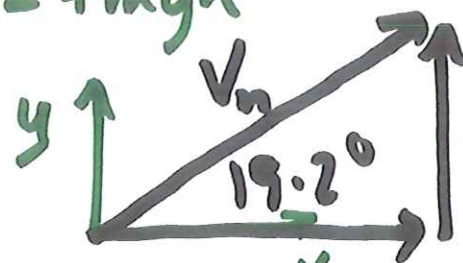Set zero of P.E. @ initial point.

Start: PE = 0   KE = 0   T.M.E. = 0   gravity is conservative

nadir: PE = -mgh   KE = $\frac{1}{2}mV_n^2$ T.M.E. = 0

$$V_n^2 = 2gh$$

$$= +mgh$$

$$V_n = \sqrt{2gh}$$

$$V_n^2 = 2gh = V_{nx}^2 + V_{ny}^2$$

$V_{ny} = V_n \cdot \sin 19.2°$

$V_{nx} = V_n \cdot \cos 19.2°$

$$\underbrace{\frac{1}{2}m V_n^2 \sin^2 19.2°}_{} + \underbrace{\frac{1}{2}V_n^2 \cos^2 19.2°}_{} = \underbrace{\frac{1}{2}m V_n^2}_{KE}$$

zenith: $\underline{PE} = -mgh\cos^2 19.2°$ $KE = \frac{1}{2}m V_n^2 \cos^2 19.2°$ T.M.E. = 0

$$= mgh \cdot \cos^2 19.2°$$

$$\cos^2 19.2° = 0.89$$