speed formula

4

go over

35

A parabola described by the equation $y = x^2 - 6x + c$ is intersected exactly once in the xy-plane by the equation $y = -1$. What is the value of c?

$0 = x^2 - 6x + (c-1)$

-1

36

In a certain function, a is a constant. The value of the function is 5 when $x = b$. If the function can be modeled using the equation $f(x) = ax^2$, what is the value of the function when $x = 3b$?

$5 = ab^2$ $\frac{5}{a} = \frac{ax^2}{a}$

$x = 3b$

$\frac{\sqrt{5}}{\sqrt{a}} = \sqrt{x^2}$

3

$a = 1$

$5 = ab^2$ $x = 3b$

$5 = a$ 1

$\sqrt{5} = \sqrt{b^2}$ $x = 3b$

$\sqrt{5} = b$

$x = 3\sqrt{5}$

$\frac{8540\text{ km}}{1\text{ hr}} \times \frac{1\text{ hr}}{3600\text{ sec}}$

$\frac{8560\text{km}}{1\text{hr}} \times \frac{1\text{hr}}{3600\text{sec}}$

Questions 37 and 38 refer to the following information.

To leave the Moon's gravity well, a shuttle must reach speeds of 8568 kilometers per hour. This speed is known as escape velocity because, if not reached, the shuttle would not be able to escape the Moon's gravity and return to Earth.

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

$S + \frac{d}{S}$

$S + \frac{d}{S}$

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

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

37

If the space shuttle traveling at escape velocity has 150 km left before reaching lunar orbit, in approximately how many seconds will the shuttle reach orbit? (Round your answer to the nearest second).

63.084

63.08

63

$t = \frac{d}{S}$ $\frac{150}{2.37}$

38

What is the space shuttle's escape velocity in meters per second, rounded to the nearest hundred? (1 kilometer = 1000 meters)?

$\frac{150\text{km}}{\text{hr}} \times \frac{\text{hr}}{3600\text{sec}} \times \frac{1000\text{m}}{1\text{km}}$

41.67

$\frac{8560\text{km}}{\text{hr}} \times \frac{\text{hr}}{3600\text{sec}} \times \frac{1000\text{m}}{\text{km}}$

2380 → 2400

END OF TEST

DO NOT RETURN TO A PREVIOUS SECTION.

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GIVEN:

MOON'S GRAVITY WELL

8568 km/hr = ESCAPE VELOCITY

THE SPACE SHUTTLE TRAVELLING at escape velocity has 150km to go (i.e. 150km more to go) before it reaches lunar orbit.

DISTANCE = SPEED × TIME

SPEED = 8568 km/hr

$= 8568 \frac{km}{hr}$

$= 8568 \frac{km}{60\ min}$

$= 8568 \frac{km}{60(60\ seconds)}$

$= 8568 \frac{km}{3600\ seconds}$

$= \frac{8568}{3600} \frac{km}{second}$

$= 2.38 \frac{km}{second}$

∴ TIME IN WHICH THE SHUTTLE WILL COVER 150 km & reach orbit =

DISTANCE = SPEED × TIME

$\frac{DISTANCE}{SPEED} =$ Time $= \frac{150}{2.38} = 63.025$ SECOND