MORE TIPS PROBLEMS INVOLVING EQUATIONS

Important Points to Keep in Mind
- There is a great deal of information that is embedded within the statement of a problem.
- Part of the statement will tell you how the unknowns are related to each other.
- Another part will tell you how to write an equation relating the unknowns.
- Yet another part will tell you what you are required to find.

1. In a two-digit number, the tens digit is four times the units digit. When the digits are reversed, the new number formed is fifty-four less than the original number. Find the original number.

tens, ones

a	b	

value $= 10(4x) = 40x$ value $= 1x = x$

Let x represent the units (ones) digit of the original #.

	b	a
digit	x	$4x$
value	$10x$	$4x$

new # = original # -54

$10x + 4x = 40x + x - 54$

2. Anil is nine years older than Amandeep. In ten years, Anil will be twice as old as Amandeep was ten years ago. Find their present ages.

Unknowns
Anil's age $\rightarrow a$
Amandeep $\rightarrow a-9$

Equation
Anil's age in 10 years will be 2 times (Amandeep's age 10 years ago)

$a + 10 = 2(a - 9 - 10)$

3. The distance between two places A and B is 240 km. A motorcyclist starts from A at the same time that a pedestrian starts from B. The speed of the motorcyclist is fifteen times that of the pedestrian. Three hours after they start, they meet at point M. How far is this point from both A and B?

Hint: $v = \frac{d}{t}$
$\therefore d = vt$
and $t = \frac{d}{v}$

240

A   15x   M   x   B
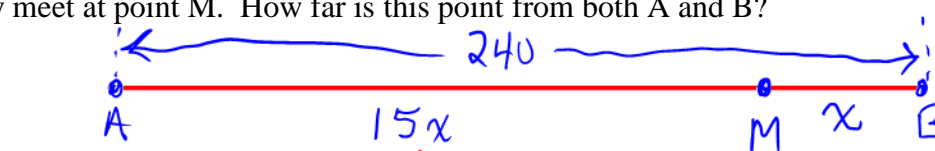
dist. = dist.
$15x + x = 240$

Motorcyclist moving 15 x faster
$\therefore$ covers 15 x distance pedestrian travels in same time.

4. Three integers are unknown but are related to each other. The second integer is three times the first integer and one-fifth of the third integer. If the sum of the three integers is 266, find the value of each integer.

$x \rightarrow$ smallest $\rightarrow \frac{1}{15}\ell$ $\frac{1}{3}m$
$3x \rightarrow$ middle $\rightarrow \frac{1}{5}\ell$ m
$5(3x) \rightarrow$ largest $\rightarrow \ell$ $5m$
$= 15x$

$x + 3x + 15x = 266$

Answers

1. 82, 28   **2.** ~~12, 21~~   **3.** 225 km, 15 km   **4.** 14, 42, 210

39, 48