SECTIONS 2.4 & 2.5

(1) let x = the number

$$3x + (x+7) = -11 - 2x$$

$3x$: 3 times a number; $(x+7)$: 7 more than the number; -11: the sum; $-2x$: twice the number; the difference

$$4x + 7 = -11 - 2x$$
$$4x + 2x = -11 - 7$$
$$6x = -18$$
$$x = \frac{-18}{6}$$
$$x = -3$$

The number is -3.

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(2)

let N = the number of sales of Toyota (in thousands)

then $N - 40$ = the number of sales of Honda (in thousands)

N: 40 thousand less than Toyota

then

$$N + (N - 40) = 814$$

$N + (N-40)$: total number of sales of the two cars (in thousands)

$$2N - 40 = 814$$
$$2N = 814 + 40$$
$$2N = 854$$
$$N = \frac{854}{2} = 427 \text{ thousand}$$
$$N - 40 = 427 - 40 = 387 \text{ thousand}$$

There were 427,000 Toyota and 387,000 Honda.

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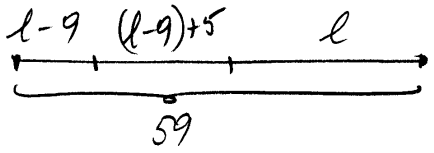
(3)



let l = length of the longest piece

then $l - 9$ = length of the shortest piece

9 in short!

then $(l-9)+5$ = length of the middle piece

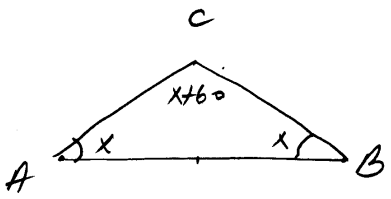
5 in here!

Total length is 59 in

$$(l-9) + (l-9+5) + l = 59$$
$$3l - 13 = 59$$
$$3l = 59 + 13$$
$$3l = 72$$
$$l = \frac{72}{3} = 24 \text{ in longest piece}$$
$$l - 9 = 24 - 9 = 15 \text{ in shortest piece}$$
$$(l-9)+5 = 15 + 5 = 20 \text{ in middle}$$

Check: $24 + 15 + 20 = 59$ in total

(4)



Given $A = B$

Let x = the measure of A, B

Then $x+60$ = the measure of C

We know $A+B+C = 180$

$x + x + (x+60) = 180$

$3x + 60 = 180$

$3x = 120$

$x = 40$

Therefore, $A = B = 40°$

$C = 100°$

Check: $A+B+C = 180°$

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(5) Let x = the measure of an angle

Then $180 - x$ = the measure of the supplement of $\angle$

Then $90 - x$ = the measure of the complement of $\angle$

$(180-x) - 3(90-x) = 10$

$(180-x)$: its supplement

$3(90-x)$: 3 times its complement

its complement

the difference

$180 - x - 270 + 3x = 10$

$2x - 90 = 10$

$2x = 100$

$x = 50$

So, the angle is $50°$.

Check: its supplement is $180° - 50° = 130°$

its complement is $90° - 50° = 40°$

$130° - 3(40°) = 10°$

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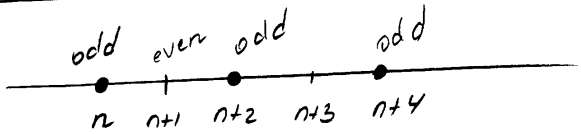
(6)



Let n = the first odd integer

then $n+2$ = the second odd integer

$n+4$ = the third odd integer

$[(n+4)-6] \cdot 2 = [n + 2(n+2)] - 23$

$[(n+4)-6]$: 6 subtracted from the 3rd integer

$[n + 2(n+2)]$: sum of 1st and twice the 2nd

-23: 23 less than

$2(n+4-6) = n + 2(n+2) - 23$

$2(n-2) = n + 2n + 4 - 23$

$2n - 4 = 3n - 19$

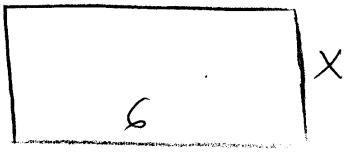
$-4 + 19 = 3n - 2n$

$15 = n$

$n = 15$

The integers are 15, 17, and 19.

(7)



Given { rectangle
length = 6 in
area = 40 in²

Find width = ?

Let x = width

then $6x = 40$ (the area)

so $x = \frac{40}{6} = \frac{20}{3} = 6\frac{2}{3}$ in

The width is $6\frac{2}{3}$ inches.

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(8) $T = 46 - 0.0054A$

A = altitude (ft)

T = temperature (°F)

(a) T = ? if A = 5000 ft

$T = 46 - 0.0054(5000)$

$T = 46 - 5.4(5)$

$T = 46 - 27.0$

$T = 19°F$ the temperature at 5000 ft

(b) A = ? if T = 32° F

$32 = 46 - 0.0054A$

$0.0054A = 46 - 32$

$0.0054A = 14$

$A = \frac{14}{0.0054} = \frac{140000}{54}$

$A = \frac{140,000}{54}^{(2)} = \frac{70,000}{27}$

$A \approx 2592.6$

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(9) N = heart rate (beats per min)

s = speed (ft per second)

$N = 1.67s + 55$

s = ? if N = 85

$85 = 1.67s + 55$

$85 - 55 = 1.67s$

$30 = 1.67s$

$s = \frac{30}{1.67} = \frac{3000}{167} \approx 18$ ft/sec

The speed that would produce a heart rate of 85 bpm is 18 ft/sec.

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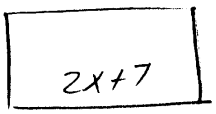
(10)



let x = width

then $2x + 7$ = length

(seven more than twice the width)

Perimeter = 2(length) + 2(width)

$50 = 2(2x+7) + 2x$

$50 = 4x + 14 + 2x$

$50 = 6x + 14$

$6x = 50 - 14$

$6x = 36$

$x = 6$ cm - width

Then

$2x+7 =$

$2(6)+7 =$

19 cm

length