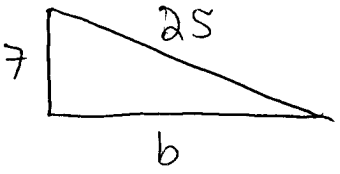
Math 100:11 Assignment 4 (Winter 2012)

9.4 42, 84, 86

9.6 2, 8, 18, 20

9.7 2, 4, 8, 16, 22, 24

9.4 42

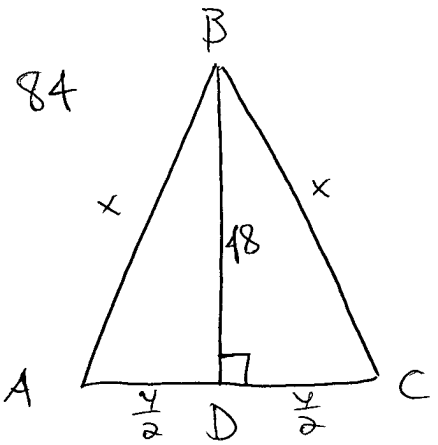


(1)

$7^2 + b^2 = 25^2 \rightarrow b^2 = 625 - 49 = 576$

$b = \sqrt{576} = 24$

84



Perimeter is 128

AB = BC

BD = 48 area?

(3)

Let $x = AB = BC$

$y = AC \rightarrow x + x + y = 128 \rightarrow y = 128 - 2x$

Consider $\triangle ABD$. By Pythagoras: $\left(\frac{y}{2}\right)^2 + 48^2 = x^2$

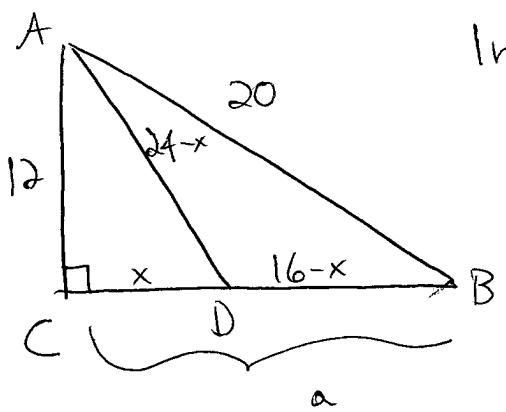
$\left(\frac{128-2x}{2}\right)^2 + 2304 = x^2 \Rightarrow (64-x)^2 + 2304 = x^2$

$\Rightarrow 64^2 - 2(64)(x) + x^2 + 2304 = x^2 \Rightarrow 4096 - 128x + 2304 = 0$

$\Rightarrow 6400 = 128x \Rightarrow \boxed{x = 50}$ $\quad y = 128 - 2(50) = 28$

This area $= \frac{1}{2}bh = \frac{1}{2}(28)(48) = 672\ in^2$ (3)

86.



In $\triangle ABC$, $12^2 + a^2 = 20^2$

$\rightarrow a^2 = 400 - 144 = 256 \rightarrow a = 16$

Let $x = CD$ then $x + DB = 16$

$\rightarrow DB = 16 - x$

$AD = DB + 8 = 16 - x + 8 = 24 - x$

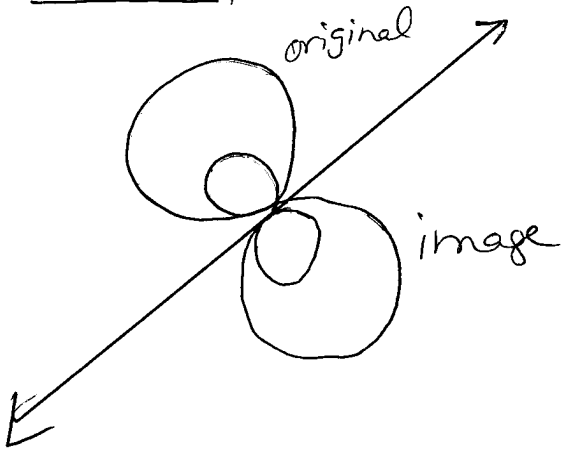
So use Pythagoras on ΔACD:

$$12^2 + x^2 = (24-x)^2 \Rightarrow 144 + x^2 = 576 - 48x + x^2$$

$$\Rightarrow 48x = 576 - 144 = 432 \Rightarrow x = \frac{432}{48} = 9$$

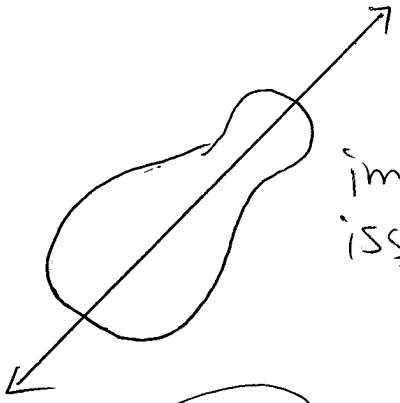
Thus $\boxed{CD = 9}$

9.6 2



(1)

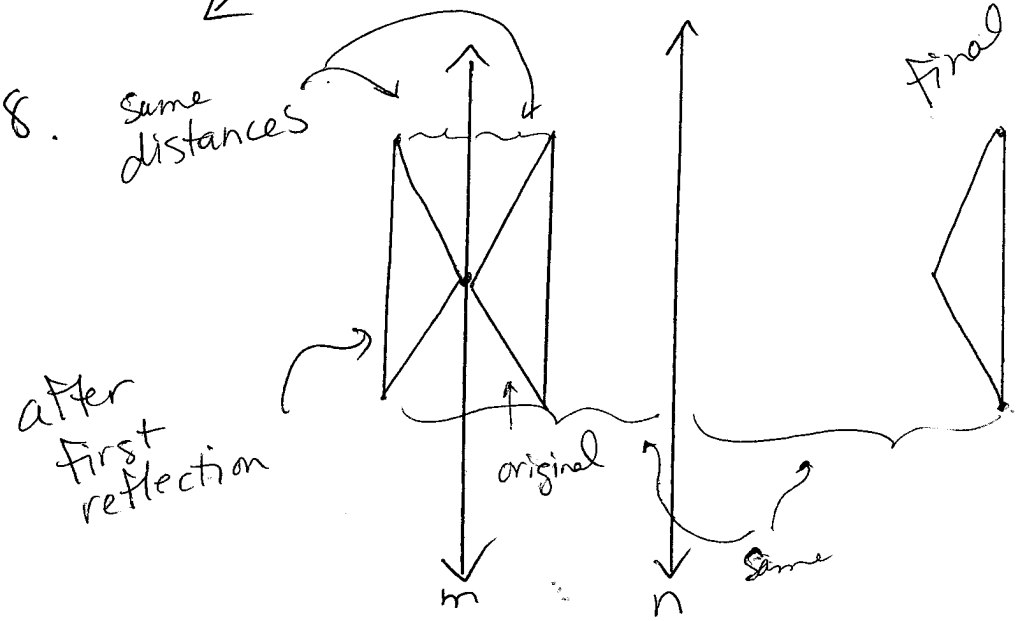
8.



(1)

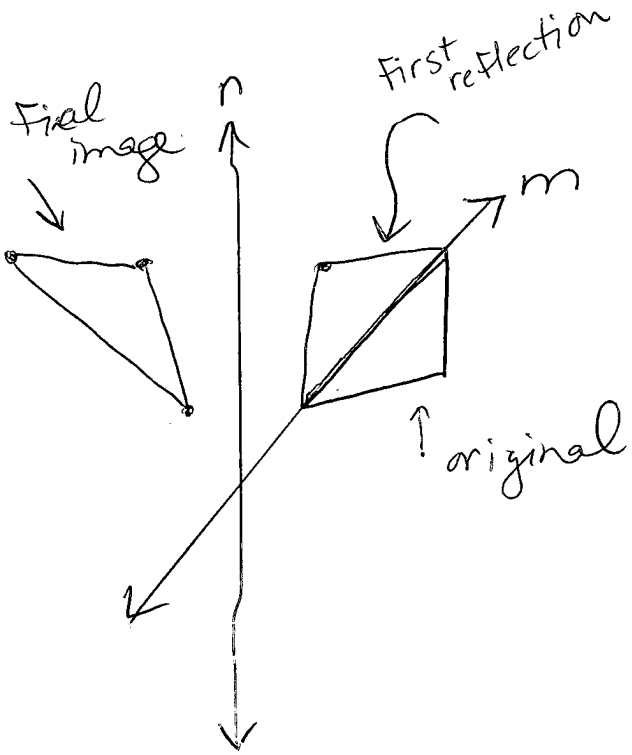
image = original because object is symmetric about line of reflection

18.



(= translation of distance twice between 2 lines

(2)

20. 

(3)

(2)

9.7 2. Sum of angles in $\Delta > 180°$? Spherical / Riemannian (1)

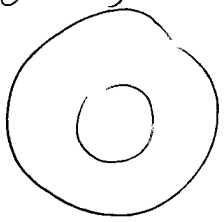
4. Lobachevskian quadrilateral - sum of angles must be <u>less than</u> 360° (1)

8. Slope representing Earth - spherical/Riemannian geometry (1)

16. nut is equivalent to B + D (1)

22. Mixing bowl + colander - these are different because a colander has many holes + a bowl has none (1)

24. Compact disc + phonograph record - topologically equivalent - both have one hole (1)



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