AW 3

1a. $4 \text{ liters} \cdot \frac{1 \text{ Gallon}}{3.7854 \text{ liters}} = \boxed{1.0567 \text{ Gallons}}$

b. $10 \text{ kilograms} \cdot \frac{2.2 \text{ pounds}}{1 \text{ kilogram}} = \boxed{22 \text{ pounds}}$

c. $1 \text{ inch} \cdot \frac{1 \text{ ft}}{12 \text{ in}} \cdot \frac{1 \text{ yd}}{3 \text{ ft}} = \frac{1}{36} \text{ yards} = \boxed{0.0278 \text{ yards}}$

d. $1 \text{ pound} \cdot \frac{1 \text{ kilogram}}{2.2 \text{ pounds}} \cdot \frac{1000 \text{ grams}}{1 \text{ kilogram}} = \boxed{454.5455 \text{ grams}}$

e. $3 \text{ m}^2 \cdot \left(\frac{100 \text{ cm}}{1 \text{ m}}\right)^2 = \boxed{30{,}000 \text{ cm}^2}$

f. $1 \text{ liter} \cdot \frac{1000 \text{ milliliters}}{1 \text{ liter}} \cdot \frac{1 \text{ cm}^3}{1 \text{ milliliter}} \cdot \left(\frac{1 \text{ in}}{2.54 \text{ cm}}\right)^3 = \boxed{61.0237 \text{ in}^3}$

2. a. $30 \frac{\text{zorbyl}}{\text{fleech}}$ $\quad \frac{88 \text{ ft}}{1 \text{ zorbyl}}$ $\quad \frac{1 \text{ fleech}}{3 \text{ min}}$

so $30 \frac{\text{zorbyl}}{\text{fleech}} \cdot \frac{88 \text{ ft}}{\text{zorbyl}} \cdot \frac{1 \text{ fleech}}{3 \text{ min}} = \boxed{880 \frac{\text{ft}}{\text{min}}}$

b. $880 \frac{\text{ft}}{\text{min}} \cdot \frac{1 \text{ mi}}{5280 \text{ ft}} \cdot \frac{60 \text{ min}}{1 \text{ hour}} = \boxed{10 \frac{\text{miles}}{\text{hour}}}$

c. $300 \text{ ft} \cdot \frac{1 \text{ min}}{880 \text{ ft}} = \boxed{0.3409 \text{ min}}$

(from (a))

3. Notebook price: 60 merbucks = 25 dollars

Want: $\frac{\text{dollars}}{\text{merbuck}}$ $\quad$ so $\frac{25 \text{ dollars}}{60 \text{ merbucks}} = \boxed{0.4167 \frac{\text{dollars}}{\text{merbuck}}}$

4. a.

200 Merbucks per octopus
100 Merbucks per shark
50,000 Merbucks total
8 arms per octopus
4 arms per shark

So - $O$ octopi
$S$ sharks

Total cost equation:

$$200O + 100S = 50{,}000$$

If 8 arms per mutant:
then 1 octopus per shark:
$O = S$

If 4 arms per shark:
then need twice as many sharks as octopi:
$2O = S$
$O = \frac{1}{2}S$

b. 8 arms per mutant:

$200O + 100S = 50{,}000$
$200S + 100S = 50{,}000$
$300S = 50000$
$S = \frac{50{,}000}{300} = 166.67$
So **166 mutants**

4 arms per mutant:

$200O + 100S = 50{,}000$
$200(\frac{1}{2}S) + 100S = 50{,}000$
$100S + 100S = 50{,}000$
$200S = 50{,}000$
$S = \frac{50{,}000}{200}$
$S = 250$
So **250 mutants**

5. 4 merfolk per family - 2 adult & 2 children
2 slices per adult, 4 per child - so
1.5 pizzas per family

These are nobility, so figure $12 per pizza.
100 families.

$$100 \text{ families} \cdot \frac{1.5 \text{ pizzas}}{1 \text{ family}} \cdot \frac{\$12}{\text{pizza}} = \boxed{\$1800}$$