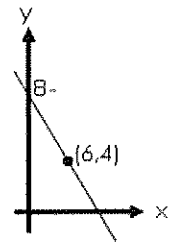
Homework Sheet 2 — Mark:

1 Evaluate $14.3 + 8.2 \times 30$

$14.3 + 246 = 260.3$

2 Find the equation of the given straight line.



$m = \frac{4-8}{6-0} = \frac{-4}{6} = -\frac{2}{3}$

$y = -\frac{2}{3}x + 8$

3 Evaluate without a calculator:

$81^{\frac{3}{4}}$

$\sqrt[4]{81^3} = 3^3 = 27$

4 Change the subject of the formula to *r*: $p = \frac{3r^2}{y}$

5 Solve $5\tan x° + 3 = 4$ (for $0 < x < 360$)

$5\tan x° = 1$

$\tan x° = \frac{1}{5}$

S | A

T | C

$\theta = \tan^{-1}\frac{1}{5}$

$= 11.3°$

$x = 11.3°, 191.3°$

6 $C = \frac{5}{9}(F - 32)$

Work out, without a calculator, the Celsius temperature when the Fahrenheit temperature is 104.

$C = \frac{5}{9}(104 - 32)$

$C = \frac{5}{9}(72) = 40°C$

7 Factorise fully: $3x^2 + 9x - 30$

$3(x^2 + 3x - 10)$

$3(x+5)(x-2)$

8 A bottle contains 336ml which is 30% more than it used to. What was the **original** volume?

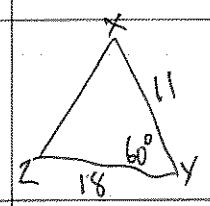
$130\% = 336$

$1\% = 336 \div 130$

$100\% = (336 \div 130) \times 100 = 258.46...$

$= 258.5ml$

9 Triangle XYZ has XY=11cm, YZ=18cm, angle XYZ=60°. Find XZ correct to 3s.f.



$XZ^2 = XY^2 + YZ^2 - 2XY \times YZ \times \cos 60°$

$= 11^2 + 18^2 - (2 \times 11 \times 18 \times \cos 60°)$

$= 445 - 198$

$= 247$

$XZ = 15.71... = 15.7cm$

10 Find the roots of the equation $2x^2 - 9x - 5 = 0$

$(2x+1)(x-5) = 0$

$x = -\frac{1}{2}$ or $x = 5$

11 Chris and David's combined weight is 133kg. David is 16kg heavier. What does Chris weigh?

$c + d = 133$ ①

$d - c = 16$ ②

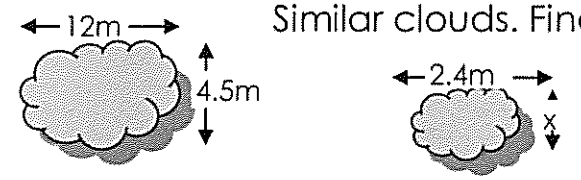
Chris is 58.5kg.

① − ② $2c = 117$

12 The coordinates of U and T are (4,1) and (7,-2) respectively. Find $\overrightarrow{TU}$

$\overrightarrow{TU} = u - t = \begin{pmatrix}4\\1\end{pmatrix} - \begin{pmatrix}7\\-2\end{pmatrix} = \begin{pmatrix}-3\\3\end{pmatrix}$

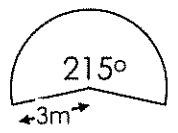
13 Similar clouds. Find x.



$LSF = \frac{2.4}{12} = \frac{24}{120} = \frac{1}{5}$

$x = \frac{1}{5} \times 4.5 = 0.9m$.

14 Calculate the arclength of this sector of a circle to 3s.f.



arc length $= \frac{215}{360} \times \pi \times 6$

$= 10.733...$

$= 10.7m$.

15 Solve this equation to 2d.p.

$3x^2 + 7x - 4 = 0$

$a=3 \quad b=7 \quad c=-4$

$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

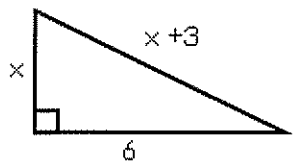
$x = \frac{-7 \pm \sqrt{7^2-(4\times3\times(-4))}}{6}$

$x = \frac{-7+\sqrt{97}}{6}$ or $x = \frac{-7-\sqrt{97}}{6}$

$x = 0.474$ $x = -2.807$

$= 0.47$ $x = -2.81$

16 Find the value of x:



$(x+3)^2 = x^2 - 6^2$

$x^2 + 6x + 9 = x^2 - 36$

$6x = -45$

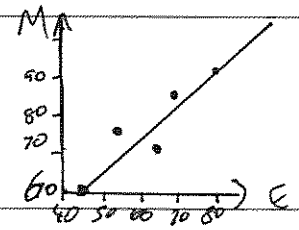
$x = -\frac{15}{2} = -7.5$

17 Simplify $\frac{\sqrt{12}}{\sqrt{60}}$

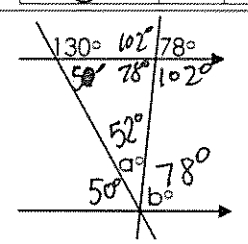
$\sqrt{\frac{12}{60}} = \sqrt{\frac{1}{5}} = \frac{1}{\sqrt{5}}$ or $\frac{1 \times \sqrt{5}}{\sqrt{5} \times \sqrt{5}} = \frac{\sqrt{5}}{5}$.

18 Create a scattergraph, indicating the line of best fit for these test results:

Maths	90	85	60	75	70
English	80	70	45	55	65



19 Find *a* and *b*.



20 Prove the following

$8\sin^2 A + 8\cos^2 A = 8$

$8(\sin^2 A + \cos^2 A) = 8(1)$

$= 8$ as required.