St. Peter the Apostle High School

Mathematics Dept.

N5 Practice Prelim Six Paper 1

Duration: 1 Hour **Marks: 40**

1. Attempt ALL questions.
2. You **MAY NOT** use a calculator.
3. Write your solutions on the blank paper provided.
4. Full credit will be given only where the solution contains appropriate working.
5. Square-ruled paper will be provided if necessary.

Based on Credit Prelim 07/08

Formula Sheet

The roots of $ax^2 + bx + c = 0$ are $x = \dfrac{-b \pm \sqrt{(b^2 - 4ac)}}{2a}$

Sine rule: $\dfrac{a}{\sin A} = \dfrac{b}{\sin B} = \dfrac{c}{\sin C}$

Cosine rule: $a^2 = b^2 + c^2 - 2bc \cos A$ or $\cos A = \dfrac{b^2 + c^2 - a^2}{2bc}$

Area of a triangle: Area = ½ $ab \sin C$

Volume of a sphere: Volume = $\dfrac{4}{3}\pi r^3$

Volume of a cone: Volume = $\dfrac{1}{3}\pi r^2 h$

Volume of a pyramid: Volume = $\dfrac{1}{3}Ah$

Standard deviation: $s = \sqrt{\dfrac{\sum(x-\bar{x})^2}{n-1}} = \sqrt{\dfrac{\sum x^2 - (\sum x)^2/n}{n-1}}$, where n is the sample size.

Marks

1. Evaluate $5\cdot 9-6\cdot 3\div 5$ **2**

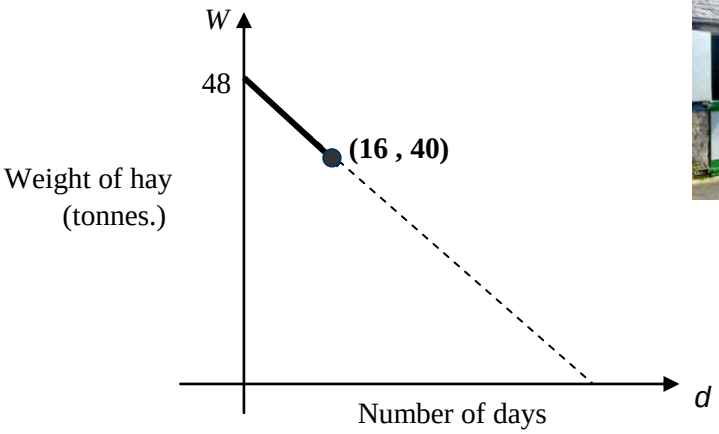
2. $x=\dfrac{3(y+2)}{5}$ Change the subject of the formula to *y*. **3**

3. Evaluate $2\dfrac{1}{3}+\dfrac{4}{5}$ of $1\dfrac{3}{7}$ **3**

4. **a)** Factorise $2x^2+3x-5$ **2**

b) **Hence,** or otherwise, factorise $2(x-3)^2+3(x-3)-5,$ leaving your answer in its simplest form. **2**

5. The local riding stables buy in 48 tonnes of hay to feed the horses during the winter season, which lasts for 93 days.
After 16 days they have 40 tonnes of hay left.
The graph below illustrates the situation.



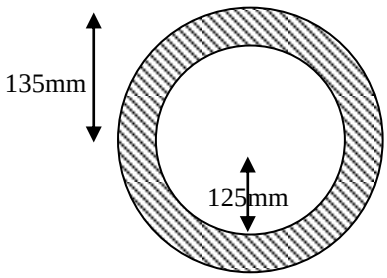
a) Find the equation of the line shown above. **3**

b) If the horses continue to consume the hay at this rate, will it last to the end of the winter season? **3**

6. Calculate the shaded area between the two concentric circles as shown:

The radius of the larger circle is **135mm** and the radius of the smaller circle is **125mm**.

Leave your answer in terms of π. **4**

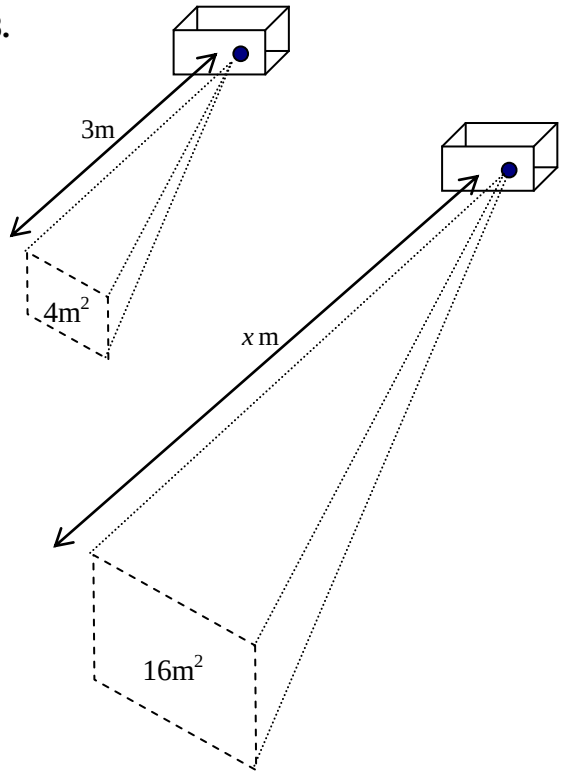


Marks

7. **a)** Remove the brackets and simplify $x^{\frac{2}{3}}\left(x^{\frac{1}{3}}+3\right)$ **2**

b) Solve the following for x. $5^x = 25^3$ **2**

8.



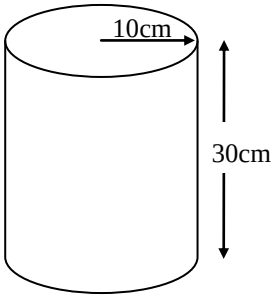
A projector positioned 3metres from a screen produces a rectangular image of 4 square metres.

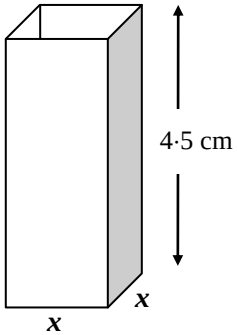
The projector is moved further back, as shown, and the rectangular image now produced is 16 square metres.

Calculate how far the projector is from the image now.
(i.e. the distance x m in the diagram)

3

9. A water container in the shape of a cylinder with radius 10 centimetres and height 30 centimetres is shown below. [diagrams are not drawn to scale]





a) Calculate the volume of the cylinder, in cm^3, giving your answer **correct to 1 significant figure**. [take $\pi = 3{\cdot}14$] **2**

b) The cylinder is filled with water to the amount calculated in part (a) above. The water is then poured from the cylinder into 500 small cuboid-shaped boxes which are to be used to make ice blocks.

The water in the cylinder **exactly fills** the 500 boxes.

Each cuboid box has a square base of length $\boldsymbol{x}$ cm and a height of 4·5cm.

Calculate the value of $\boldsymbol{x}$. **4**

Marks

10. Sam, Roisin and Fieza are studying Law at University.
At the beginning of term Sam buys 3 hardback notebooks and 4 loose leaf pads for £10.25.
Roisin buys 6 hardback notebooks and 2 loose leaf pads for £13.00.
How much will Fieza pay for 5 hardback notebooks and 1 loose leaf pad? **5**

End of question Paper

Total Marks: 40