Maths Exercises - Worksheet 2

Pure Maths

1. Gary says that "If you add a multiple of 2 to any other multiple of 2, the result will be a multiple of 4". Is Gary right? .....

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2. Simplify the following surds: a) $\sqrt{20}$ b) $\sqrt{75}$ c) $\sqrt{98}$ .....

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3. Line 1 has equation $y = 3x + 1$. Line 2 is parallel to line 1 and goes through the point (1,-2). Sketch line 2 and find its equation.

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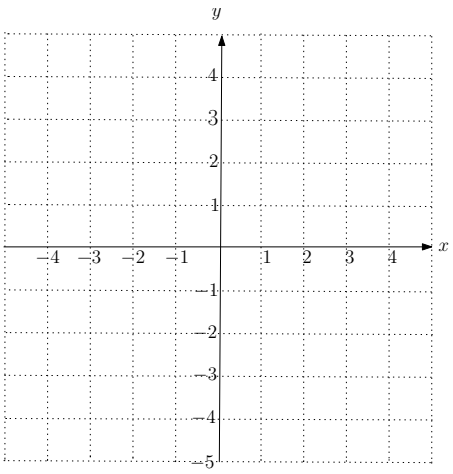

4. Evaluate the following: a) 5! b) 3!2! c) 7!/4! .....

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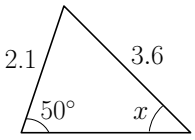
5. Given a triangle with sides 2.1cm and 3.6cm and an angle of $50°$ as follows, find the angle labelled x to 1 d.p.



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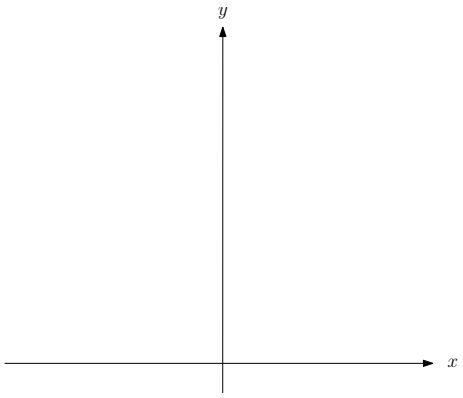
6. Fill in the following table of values for $y = 2^x$.

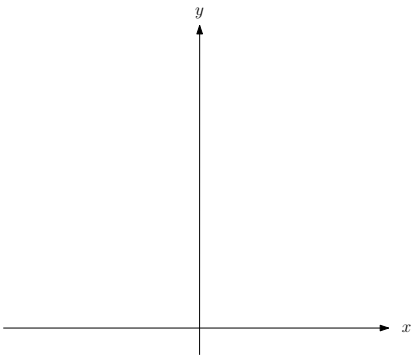
x	-3	-2	-1	0	1	2	3
y							

   Sketch the graph of $y = 2^x$.



7. Sketch the graph of $y = x^2$. Add the following 4 straight lines to your graph:

   (a) the line that goes through the points (0,0) and (4,16),
   (b) the line that goes through (0,0) and (3,9),
   (c) the line that goes through (0,0) and (2,4),
   (d) the line that goes through (0,0) and (1,1).



What do you notice? .....

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8. Sketch the lines $x = -2$, $x = 3$ and $y = 2$. Find the area contained within these lines and the x-axis. .....

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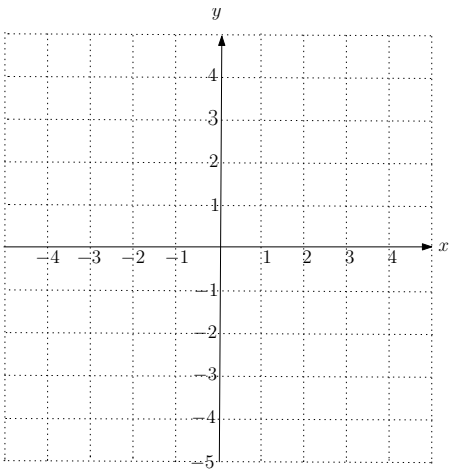
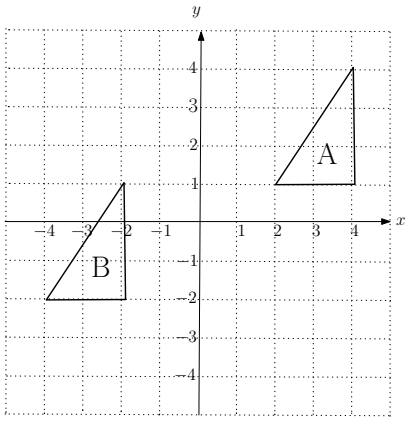


9. Identify the vector that translates shape A onto shape B. Using Pythagoras, calculate the length of this vector leaving your answer in simplified surd form.



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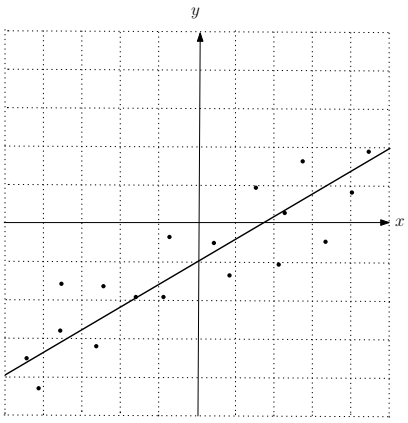
Statistics

1. Consider the scatter diagram with line of best fit below. Circle the words that correctly describe the scatter diagram.

positive **negative** **proportional** **strong** **weak**



2. There are 150 students at a college. 56 students take maths and 11 of those 56 take further maths too. 38 students take physics and 20 of those also take maths. There are only 4 students that take maths, further maths and physics and no student can take further maths without taking maths. Display this information in a Venn diagram.

Mechanics

1. Acceleration is increase in velocity or speed and can be measured in metres per second per second (m/s^2). If a car is travelling at 10 m/s and accelerates 2 m/s^2 for 10 seconds, what is the speed of the car immediately after these 10 seconds of acceleration? .....

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2. Deceleration is decrease in velocity or speed and can also measured in kilometres per (m/s^2). A lorry is travelling at 20 m/s and, in slowing traffic, within 5 seconds slows to a speed of 16 m/s. Calculate the deceleration of the lorry.

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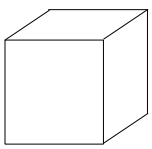
Exam Practice

A cube has a volume of 343 units^3.



Find the surface area of this cube.

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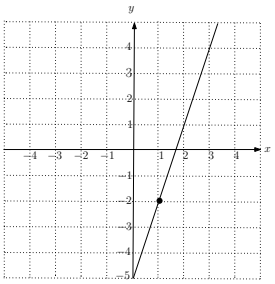
Solutions

Pure Maths

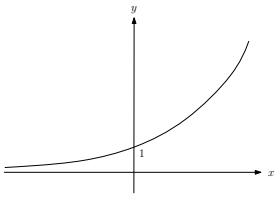
1. Gary is wrong. For example, 4 and 6 are both multiples of 2 but if you add them together you get 10 and that is not a multiple of 4. This is known as disproof by counterexample.
2. a) $2\sqrt{5}$ b) $5\sqrt{3}$ c) $7\sqrt{2}$.
3. $y = 3x - 5$



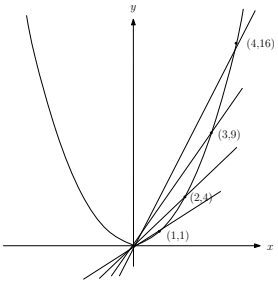
4. a) 120 b) 12 c) 210
5. $x = 26.5$ to 1 d.p.
6.

x	-3	-2	-1	0
y	1/8	1/4	1/2	1

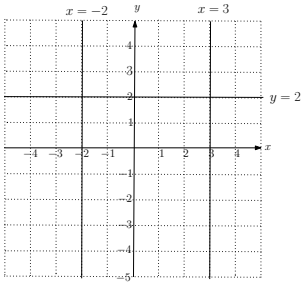
x	1	2	3
y	2	4	8



7. The lines appear to converge towards the tangent at the point (0,0).



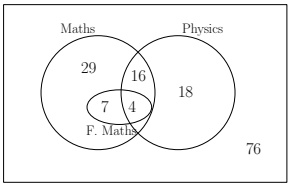
8. 10 units^2



9. $\begin{pmatrix} -6 \\ -3 \end{pmatrix}$, length $= 3\sqrt{5}$.

Statistics

1. Positive, strong.
2.



Mechanics

1. 30 m/s
2. 0.8 m/s^2

Exam Practice

294 units^2

Notes