

Pop Quiz: Proportion Equations

Name:

(1) y is in proportion to x . Given that $y = 4$ when $x = 3$, find the equation that connects x to y .

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[3]

(2) y is in inverse proportion to x . Given that $y = 7$ when $x = 6$,

(a) Find the equation that connects x to y

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(b) Calculate y when $x = 3$

(c) Calculate x when $y = 2$

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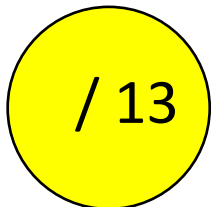
[5]

(3) The table on the right shows measures x and y .
Find the equation that describes the proportion that is
between the measurements.

x	2	6
y	20	180

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[5]

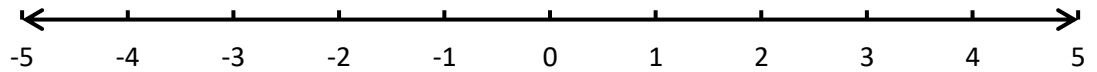


Pop Quiz: Inequalities

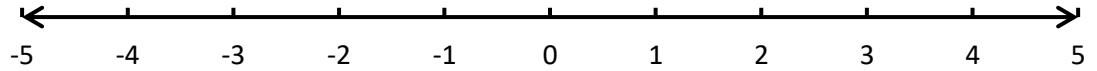
Name:

(1) Use the number lines below to display the following inequalities.

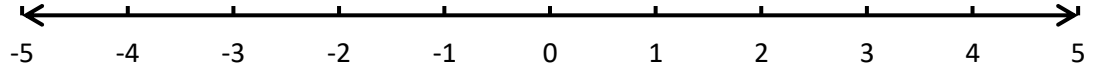
(a) $x \leq 3$



(b) $x > -1.5$



(c) $-4 < x \leq 2$



[3]

(2) Solve the following inequalities.

(a) $x + 5 > 12$

(b) $-4x \leq 20$

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[2]

(c) $5x - 2 < 3x + 46$

(d) $3(2 - x) \geq 15$

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[6]

(3) List the whole numbers that satisfy the inequality $10 < 3x + 4 \leq 28$.

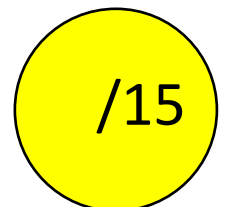
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[3]

(4) Steffan is a bus driver. Legally, bus drivers cannot drive more than 10 hours in a single day. Yesterday, Steffan drove his bus for x hours, which was legal. Write this information down as an inequality.

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[1]

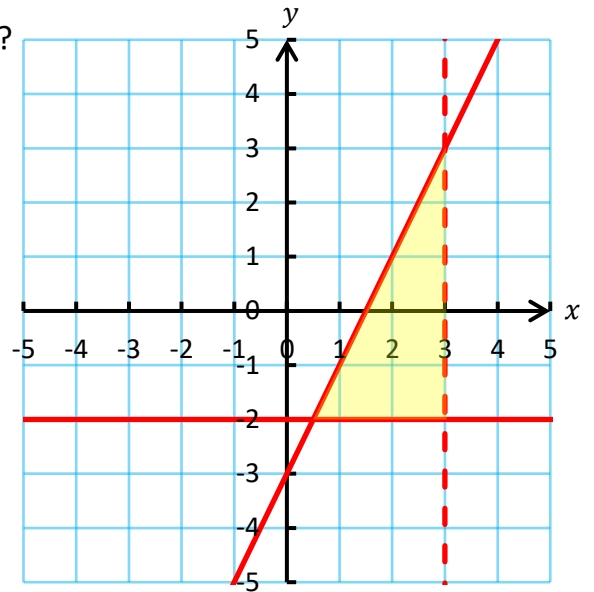


Pop Quiz: Regions of Graphs

Name:

(1) What inequalities define the region shown on the right?

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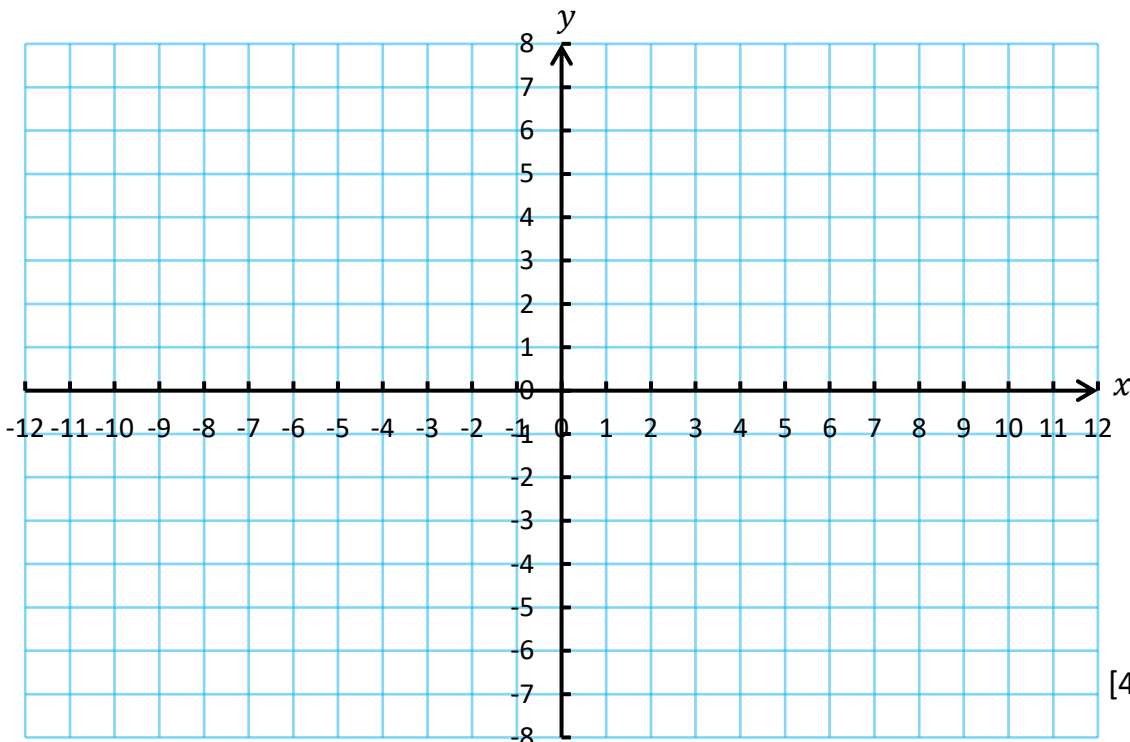
[3]

(2) On the graph paper below, shade the region that satisfies **every one** of the following inequalities.

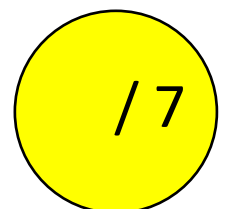
$$\begin{aligned}x + 2y &\leq 8 \\ y &\geq x - 2 \\ x &> 2 \\ y &\geq 1\end{aligned}$$

Make sure to clearly show the region that represents your answer.

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[4]

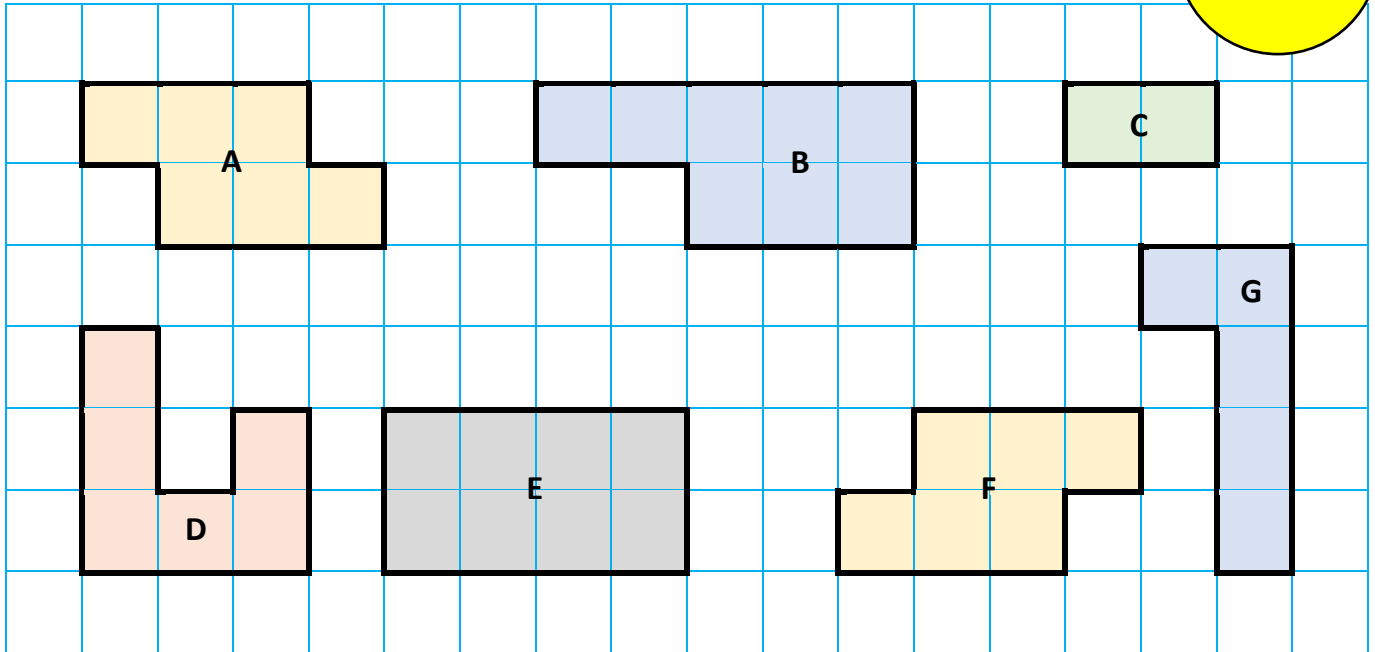


Pop Quiz: Congruent Shapes

Name:

/11

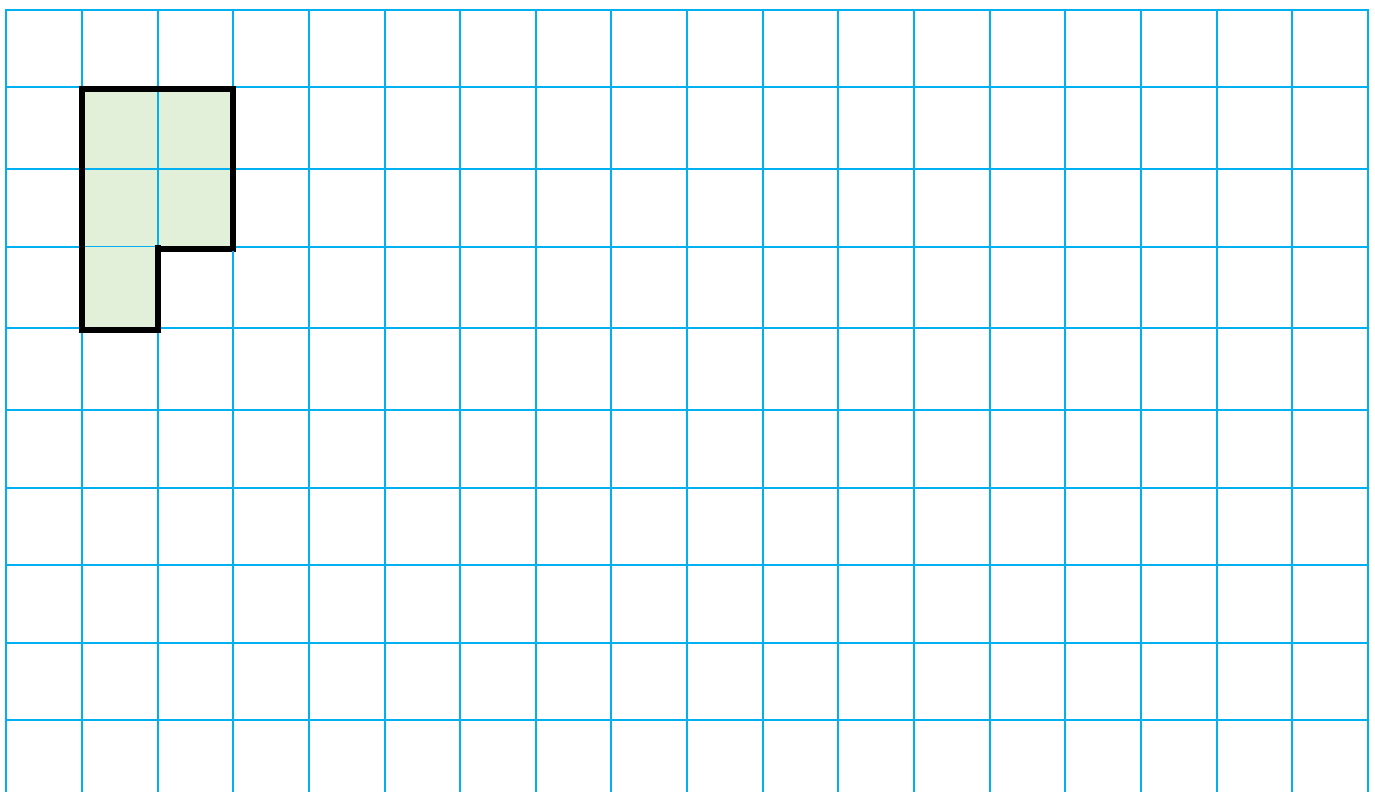
(1) Below is a collection of shapes drawn on a squared centimetre grid.



- (a) Which two shapes are congruent?
- (b) Which two shapes are similar?
- (c) Which two shapes have a perimeter of 14 cm?
- (d) Which three shapes have an area of 6 cm²?

[4]

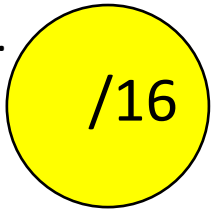
(2) On the following grid, draw the seven shapes that are congruent to the shown shape, but have different orientations.



[7]

Pop Quiz: Congruent Triangles Proofs

Name:



(1) Circle the correct proofs.

(a) Side, Angle, Side (SAS)

(b) Side, Side, Side (SSS)

(c) Angle, Angle, Angle (AAA)

(d) Angle, Side, Angle (ASA)

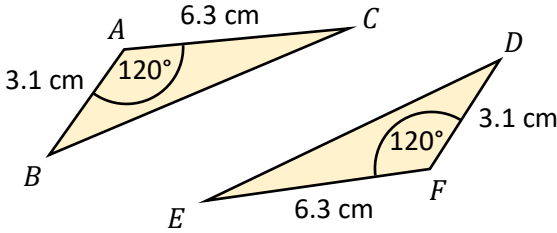
(e) Right Angle, Hypotenuse, Side (RHS)

(f) Angle, Side, Side (ASS)

[4]

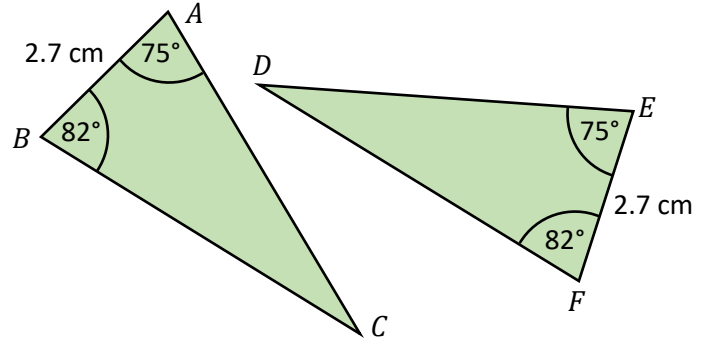
(2) Explain, noting your reasons, if the following pairs of triangles are congruent or not.

(a)



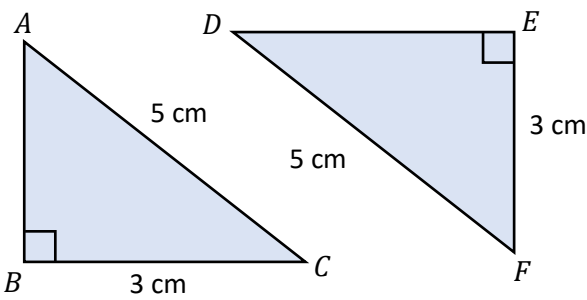
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(b)



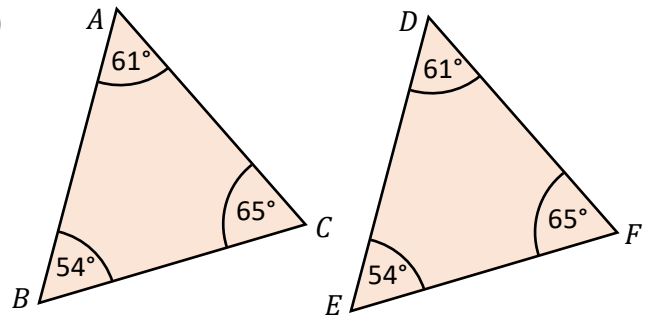
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(c)



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(d)



.....

[12]

Pop Quiz: Angles in Polygons

Name:

(1) What is the name of any shape with **7** sides? [1]

(2) (a) What is the total of the interior angles of any **hexagon**?

(b) What is the size of each angle in a **regular hexagon**?

[3]

(3) Complete the following sentences with the correct angles.

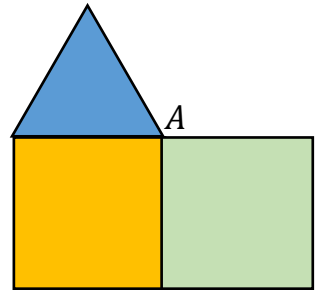
(a) The sum of the **exterior angles** of any polygon is°

(b) The sum of the **interior angles** of any **quadrilateral** is°

(c) For any vertex in a polygon, **interior angle + exterior angle** =°

[3]

(4) Gwen places two squares and one equilateral triangle together at a point **A**, as shown on the right. Which **two regular shapes** would be able to be placed at **A** in order to fill the gap?



.....

 [2]

(5) The size of three of the exterior angles of a quadrilateral are 110°, 20° and 80°.

(a) What is the size of the other exterior angle?

(b) What is the size of the interior angle near the exterior angle of 110°?

[4]

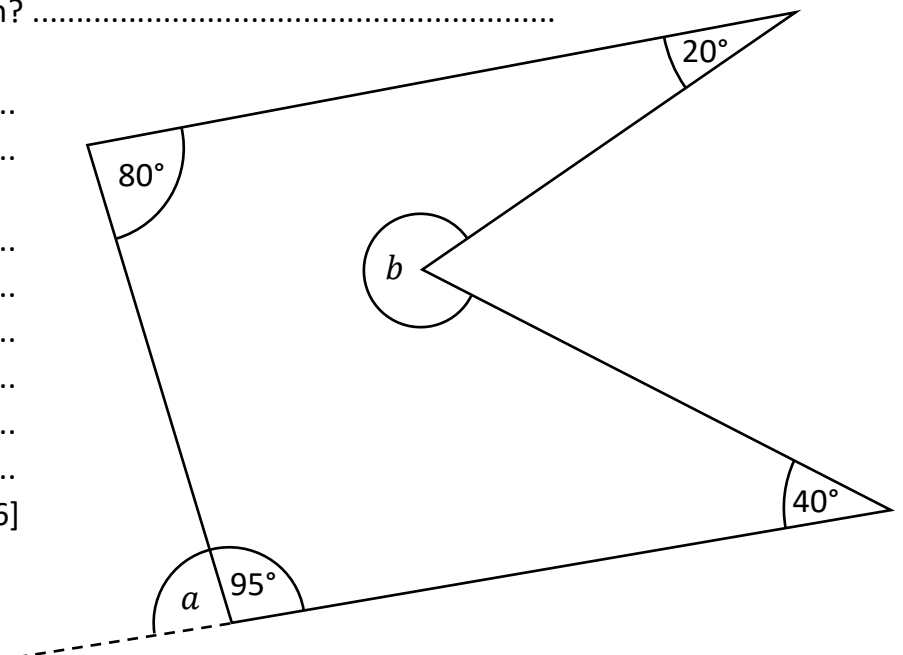
(6) The diagram on the right shows a polygon.

(a) What is the name of the polygon?

(b) What is the size of the angle *a*?

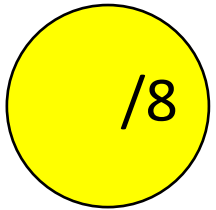
(c) What is the size of the angle *b*?

[6]

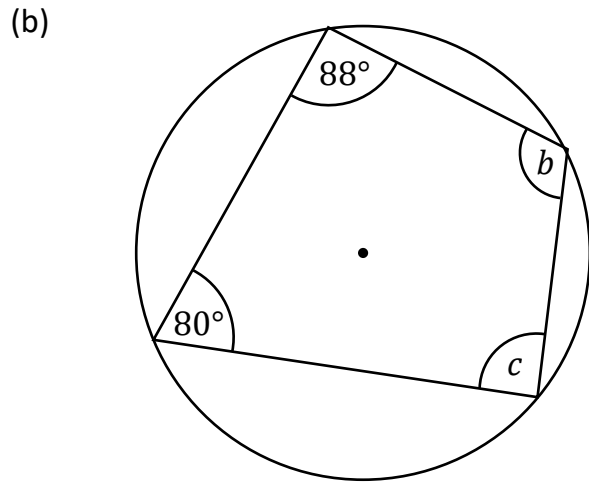
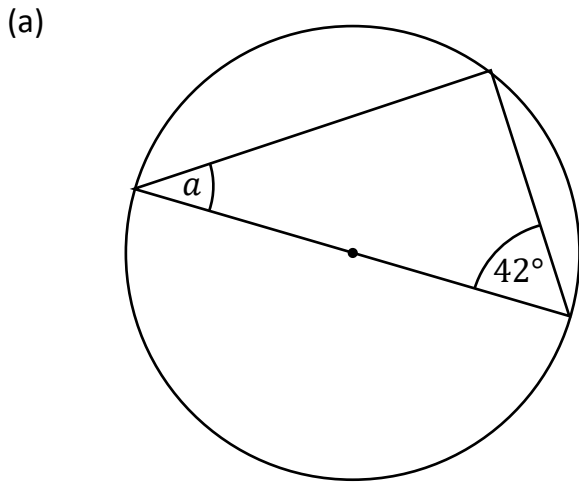


Pop Quiz: Circle Theorems

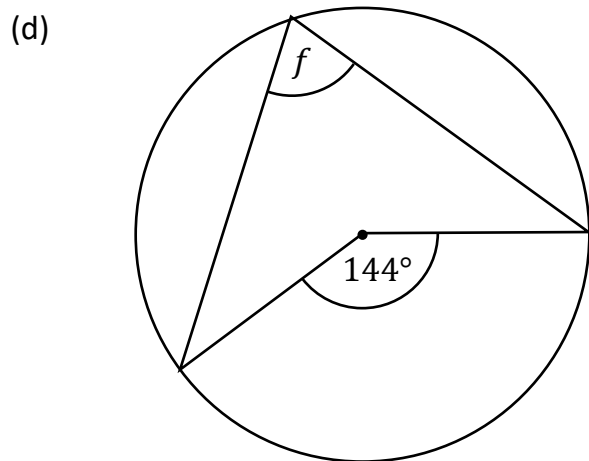
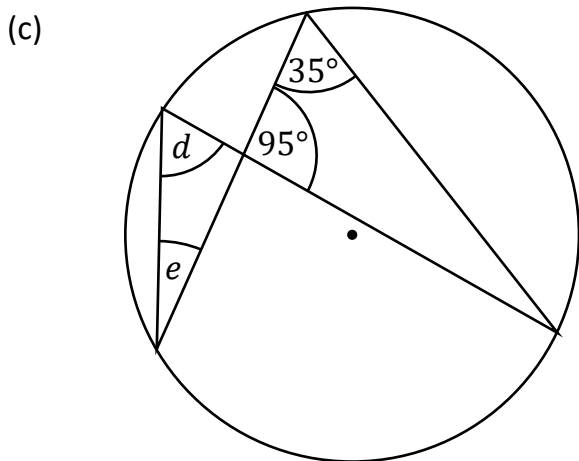
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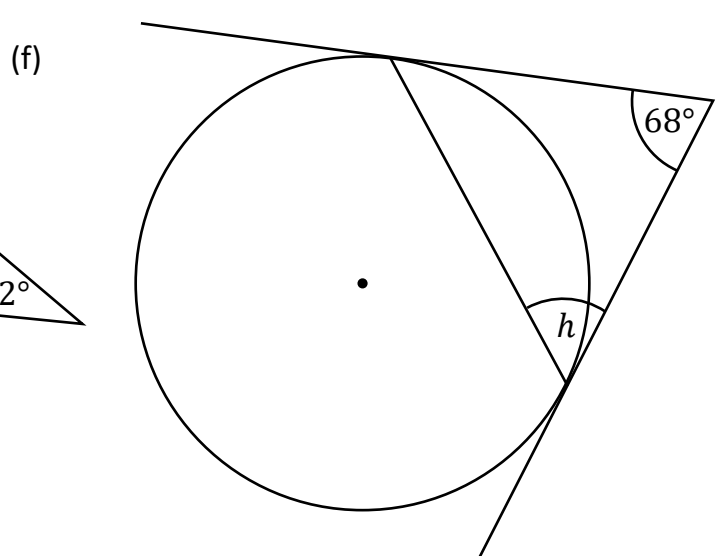
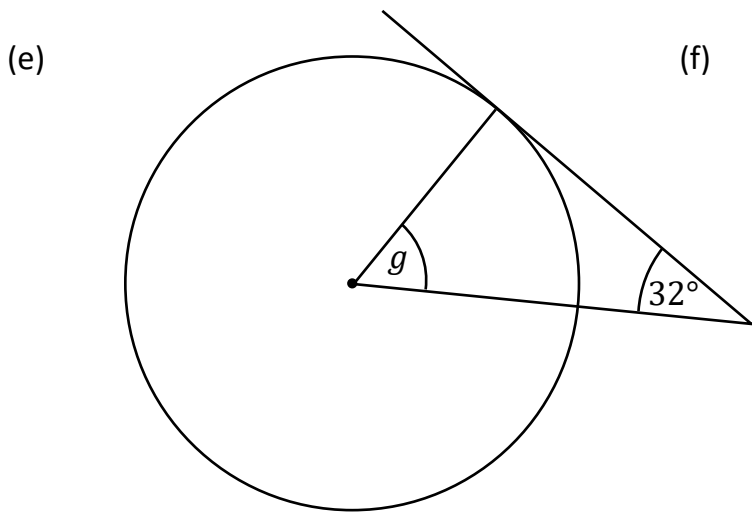
(1) Use the circle theorems to find the size of the marked angles in the following diagrams. (The diagrams are not drawn to scale.)



$a = \dots\dots\dots$ $b = \dots\dots\dots$ $c = \dots\dots\dots$



$d = \dots\dots\dots$ $e = \dots\dots\dots$ $f = \dots\dots\dots$

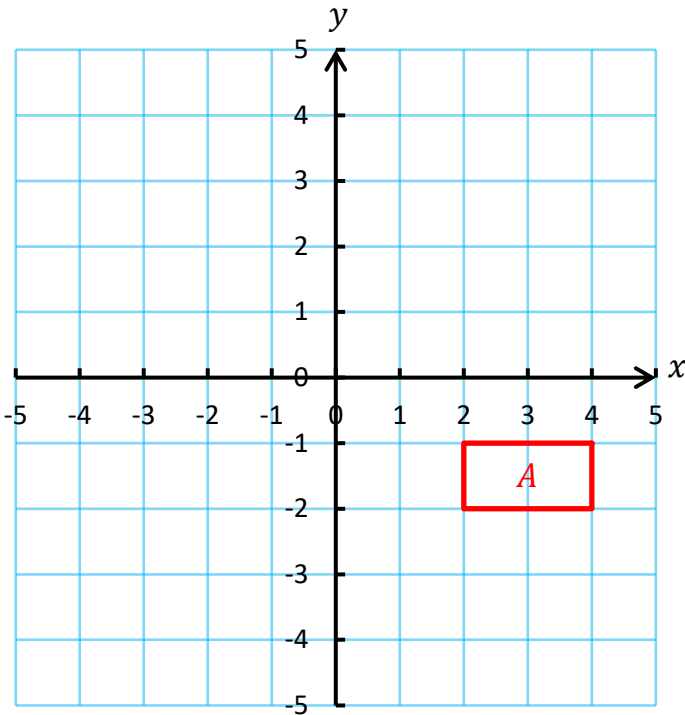


$g = \dots\dots\dots$ $h = \dots\dots\dots$

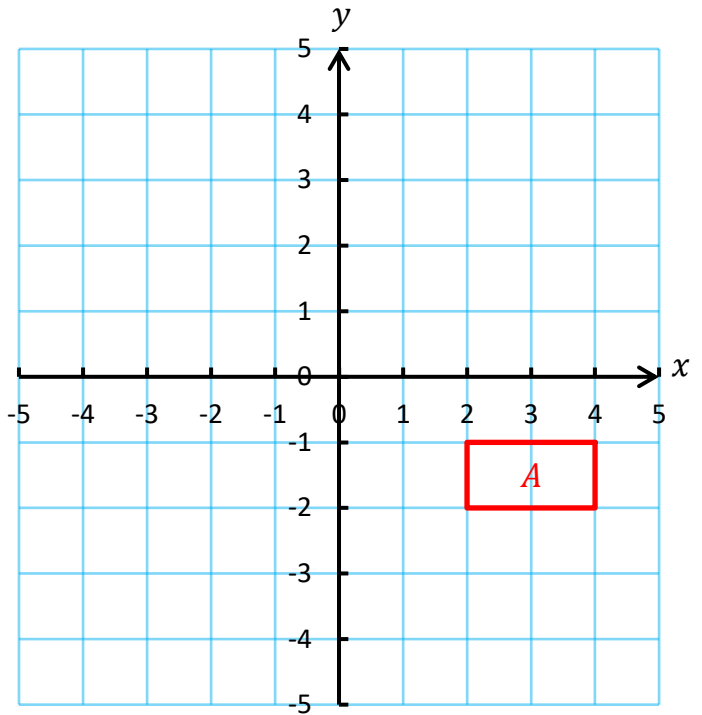
Pop Quiz: Transformations

Name:

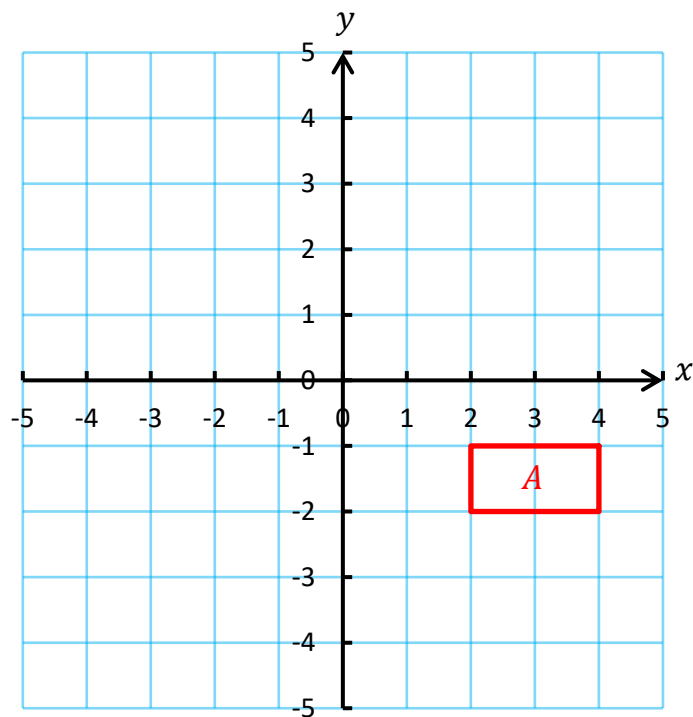
(1) (a) Translate the rectangle A using the column vector $\begin{pmatrix} -5 \\ 4 \end{pmatrix}$. [1]



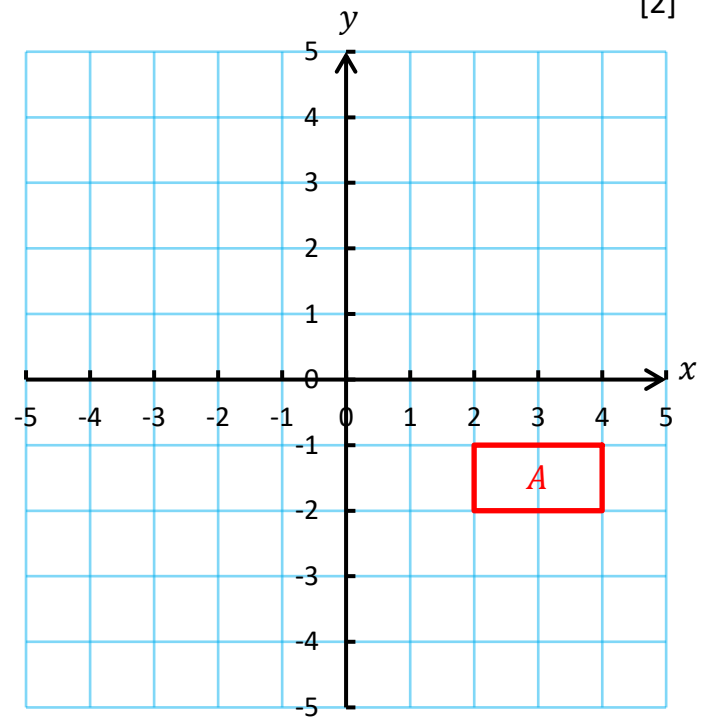
(b) Rotate the rectangle A 90° anticlockwise around the point $(1, 0)$. [2]



(c) Reflect the rectangle A in the line $x = 1$. [2]



(d) Enlarge the rectangle A using scale factor 2 and centre of enlargement $(5, -4)$. [2]



Pop Quiz: Relative Frequency

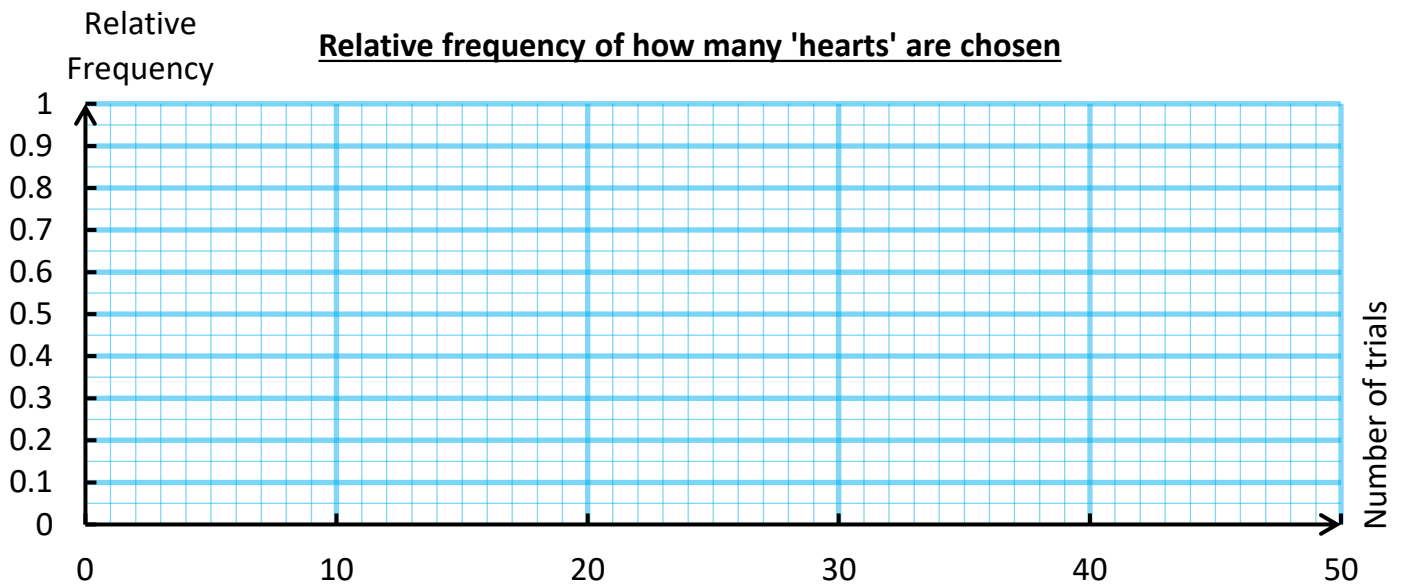
Name:

(1) Jack shuffles the 52 cards in a normal pack of playing cards and chooses one card from the pack at random. He repeats this 40 times, replacing the card in the pack each time.

(a) Complete the following table. [3]

Total number of trials	Number of hearts in these 10 trials	Total number of hearts so far	Relative frequency of the number of hearts, as a fraction	Relative frequency of the number of hearts, as a decimal
10	3		$\frac{\quad}{10}$	
20	5		$\frac{\quad}{20}$	
30	1		$\frac{\quad}{30}$	
40	2			

(b) Plot, on the graph paper below, a line graph showing what happens to the relative frequency as the number of trials increases. [2]



(c) Write down the best estimate for the probability that one card, chosen randomly from Jack's pack, is a heart. You must give a reason for your answer.

..... [2]

(d) Do you believe that Jack carried out the experiment fairly? Explain your answer.
 [1]

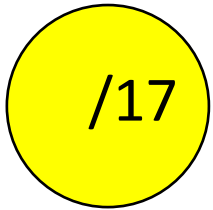
(e) Jack goes on to complete another 10 trials. The relative frequency of hearts, after these 10 new trials, is 0.28.

(i) How many hearts did Jack obtain in the first 50 trials?
 [2]

(ii) How many hearts did Jack obtain in the final 10 trials?
 [1]

Pop Quiz: Combined Events

Name:



(1) Connect the following pairs.

- Independent Events The events cannot happen together
- Mutually Exclusive Events The result of one event affects another event
- Dependent Events The result of one event does not affect another event

[3]

(2) One number is chosen at random from the grid on the right.
What is the probability that the number is:

- (a) Even?
- (b) A multiple of 3 or a multiple of 7?
- (c) A multiple of 4 or a multiple of 6?
- (d) A square number or a prime number?
- (e) A two-digit number or a cube number?
- (f) A factor of 48?

1	2	3
4	5	6
7	8	9
10	11	12
13	14	15

[6]

(3) In a questionnaire, someone asked 30 adults if they enjoyed listening to music or going to the theatre.

- 25 people enjoyed listening to music.
- 23 people enjoyed going to the theatre.
- 20 people enjoyed doing both.

(a) Draw a Venn diagram showing this information.

[6]

(b) What is the probability that a randomly chosen adult from this group

- (i) likes listening to music only?
- (ii) does not like listening to music or going to the theatre? [2]

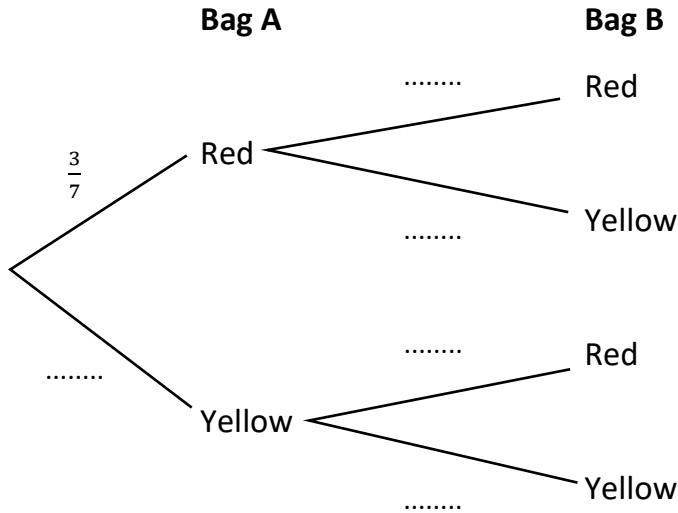
Pop Quiz: Tree Diagrams

Name:

(1) There are two bags in a game, and both bags contain coloured balls.
 Bag A contains 3 red balls and 4 yellow balls.
 Bag B contains 4 red balls and 2 yellow balls.
 A player randomly chooses one ball from each bag.



(a) Complete the following tree diagram.



[3]

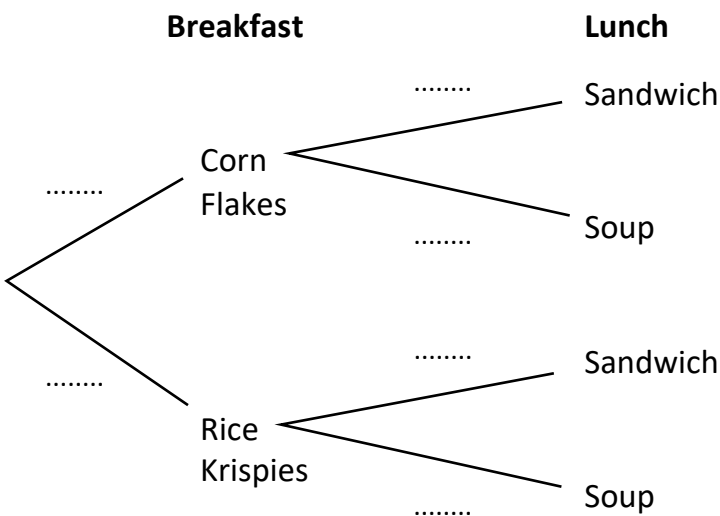
(b) Find the probability of choosing two yellow balls. [1]

(c) Find the probability of choosing a ball of each colour. [2]

(d) Find the probability of not choosing two red balls. [2]

(2) Siwan always has Corn Flakes or Rice Krispies for breakfast, and then (independently) a sandwich or soup for lunch. The probability that she has Corn Flakes for breakfast is 0.6. The probability that she has Rice Krispies for breakfast and then a sandwich for lunch is 0.28.

(a) Complete the following tree diagram. [4]



(b) Find the probability that Siwan has Corn Flakes for breakfast and then soup for lunch. [2]

Pop Quiz: Transformations of Functions

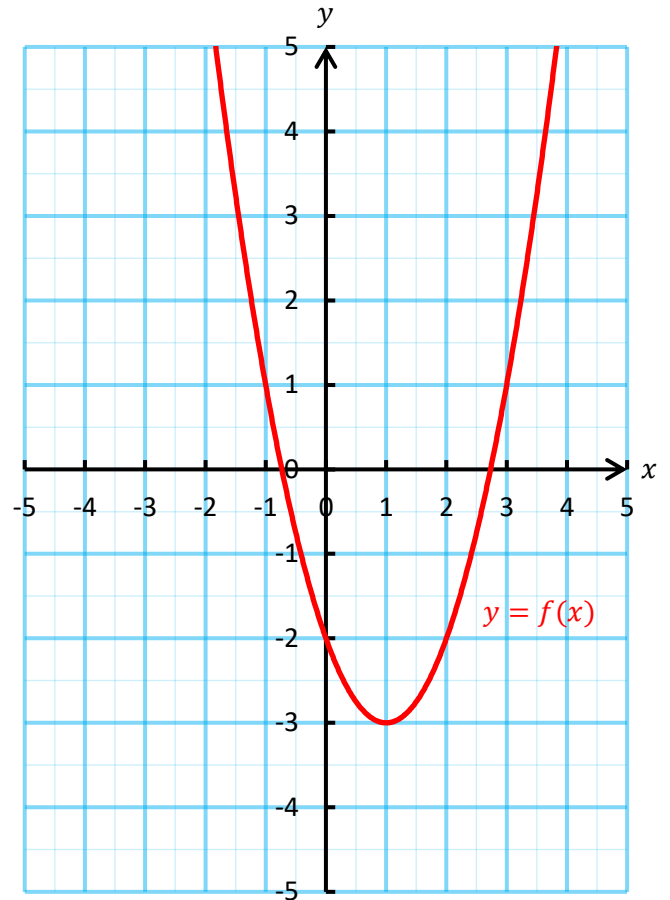
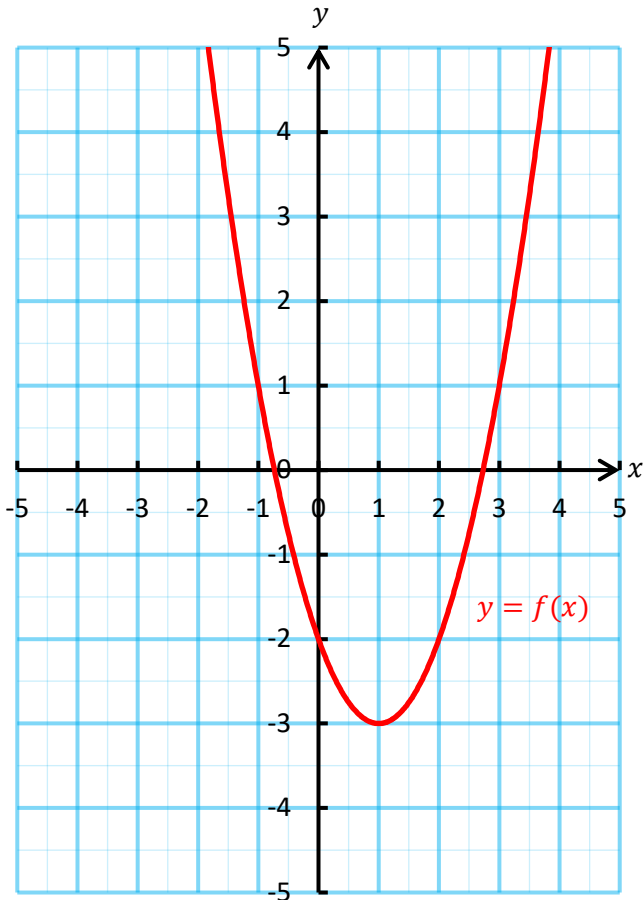
Name:

(1) Draw, on the graphs below, the following transformations.

[4]

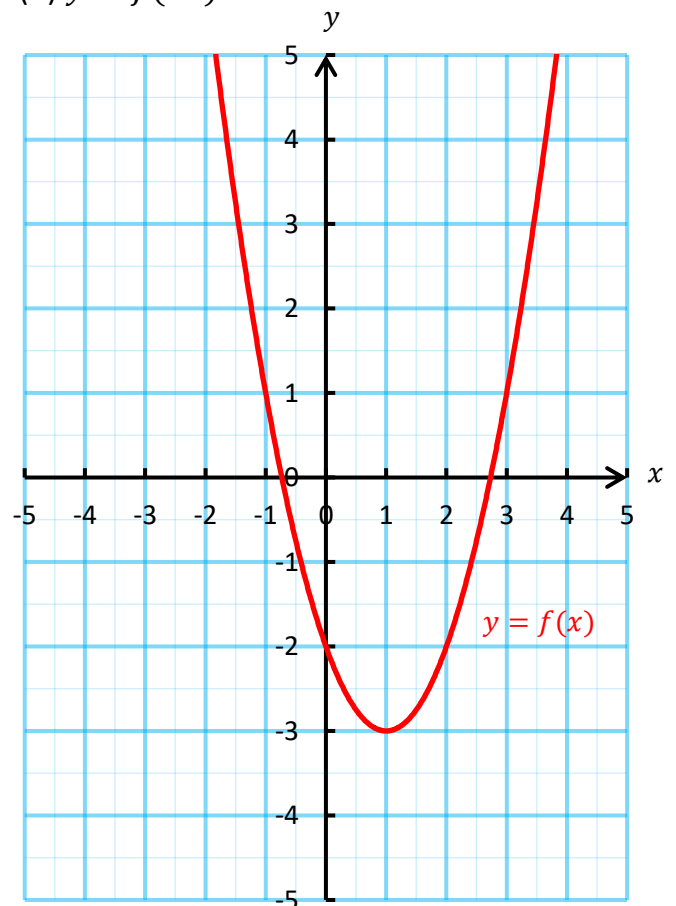
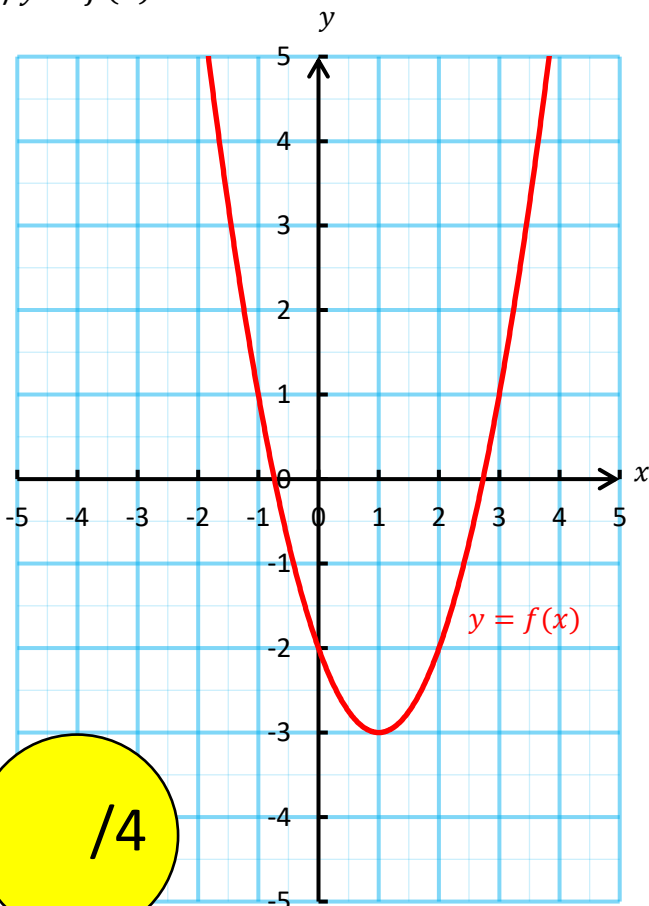
(a) $y = f(x + 2)$

(b) $y = -f(x)$



(c) $y = f(x) - 1$

(d) $y = f(2x)$



/4

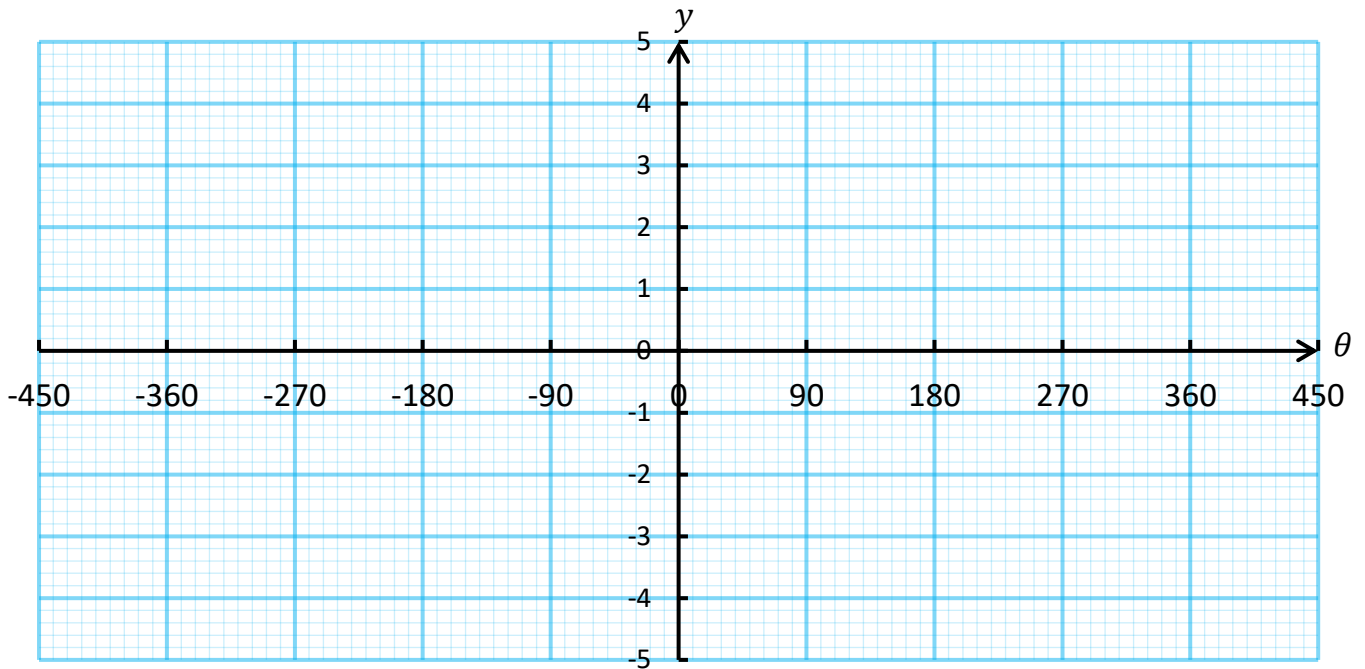
Pop Quiz: Trigonometric Graphs

Name:

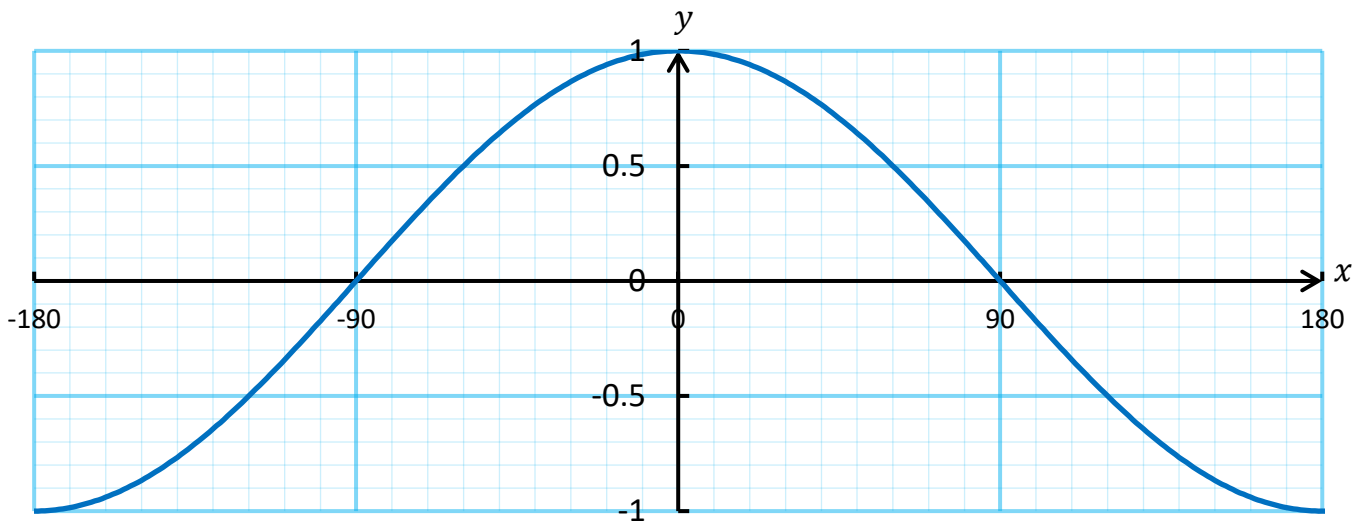
(1) On the graph paper below, sketch the graphs of $y = \sin \theta$, $y = \tan \theta$.

Remember to show any asymptotes as dotted lines.

[4]



(2) The diagram below shows a sketch of $y = \cos x$ for values of x between -180° and 180° .



(a) Calculate all the solutions of $\cos x = -0.766$ between -180° and 180° .

[2]

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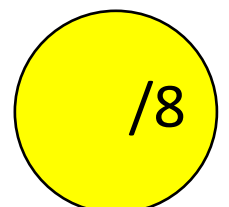
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(b) On the axes above, sketch the graph of $y = \cos(x - 20^\circ)$ for values of x between -180° and 180° .

[2]



Pop Quiz: AER, APR

Name:

(1) Lois intends to invest £4,000 into a savings account for one year. HSBC bank offer a nominal interest rate of 3.6% a year, with interest to be paid every three months.

(a) Calculate the AER for HSBC's offer. Give your answer correct to two decimal places. [4]

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(b) If Lois chooses to invest her money with HSBC for one year, how much money will be in her account at the end of the year? [2]

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(2) Elis intends to borrow £12,000 from the company BestLoan. The company offers an interest rate of 3.5% a month, and charges a monthly fee of £10 to use the account.

(a) How much interest will this loan accrue over a period of one year? [3]

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(b) Calculate the APR for this loan. [3]

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