



REVISION QUESTIONS

FORM 2 to 3  
2010-2011

1. Simplify the following:

(a)  $(3b - a)(2a + 5b) =$

(b)  $2ab^2c(4ab - 5b^2c^3) =$

(c)  $(2k - 3z)^2 =$

(d)  $\left(x - \frac{2}{5}\right)^2 =$

2. Factorize the following completely:

(a)  $16a - 2a^2 =$

(b)  $5a^2 - 5 =$

(c)  $3 - 2x - 3y + 2xy =$

(d)  $(x - 3)(y + 2)^2 + 4(3 - x) =$

(e)  $\frac{16}{25}b^2 - 1 =$

3. Simplify the following fractional expressions:

(a)  $\frac{2a^2 - 18}{3a - 9} =$

(d)  $\frac{4b^2(a - 2) - 9(a - 2)}{2ab - 3a - 4b + 6} =$

(b)  $\frac{3x - 3}{9 - 9x} =$

(e)  $\frac{xy - 2x - 3y + 6}{x^2 - 9} \div \frac{y^2 - 4}{10x + 30} =$

(c)  $\frac{2x(x - 3) - y(3 - x)}{9 - x^2} =$

4. Solve the following equations:

(a)  $2(x+1)^2 - (x-2)^2 = x(x-3)$

(b)  $(3x-4)^2 = 1$

(c)  $3x^2 = 12x$

(d)  $\frac{2}{3x^2} - \frac{1}{x^3} = \frac{5}{x^3}$

(e)  $\frac{3}{3x-15} - \frac{x-2}{x^2-25} = \frac{1}{3(x+5)}$

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5. Make the letter in the brackets the subject of the formula.

(a)  $\frac{1}{2x} - \frac{1}{3b} = \frac{1}{a}$  (x)

(b)  $m-4 = \frac{mb-a}{4}$  (m)

(c)  $x-4 = \frac{-x^2-a}{x+4}$  (x)

(d)  $\frac{m(ny-a^2)}{p} + n = 5n$  (y)

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6. Write the following as a single number in index form.

(a)  $6x^{-2} \cdot x^3 \cdot 2x =$

(b)  $(4a)^3 \div 8a^{-1} =$

(c)  $(b^2b^0b^{-3})^{-2} =$

(e)  $\left(y^{\frac{1}{3}}\right)^6 \div \left(y^2\right)^{\frac{1}{4}} =$

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7. Evaluate:

(a)  $\left(-\frac{4}{5}\right)^{-2} =$

(b)  $-5^2 + (-2)^3 =$

(c)  $\frac{(2-6)^2}{3^2-4^2} =$

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8. Given that  $A = 3.5 \times 10^{-4}$ ,  $B = 2 \times 10^2$  and  $C = 2.5 \times 10^{-3}$ , write the following in standard form.

(a)  $A + C$

(b)  $\frac{6C \times B}{2A}$

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9. Find the gradient and the  $y$  – intercept of the following lines.

(a)  $y = 5x$

(b)  $\frac{3y}{2} + \frac{x}{5} = 4$

(c)  $6y = 5 - 3x$

(d)  $y = 8$

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10. Find the equation of the straight line that passes through the points  $A(-1,0)$  and  $B(0,-2)$ .

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11. Find the equation of the straight line that is parallel to the  $x$  – axis and it passes through the point  $(2,-3)$ .

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12. On the same pair of axes, plot the lines:

(a)  $2y = x + 6$

(b)  $y - 2x = -3$

Using your graph, find the point of intersection between the two lines.

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13. Solve the following pair of simultaneous equations.

$$2a + 3b = -5$$

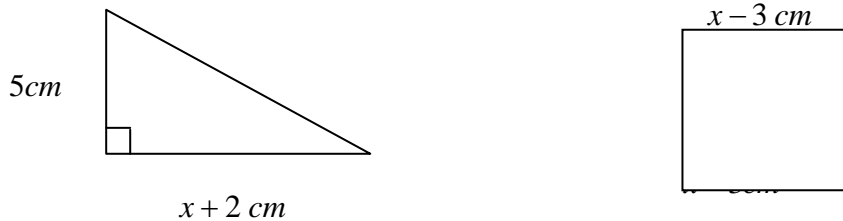
$$3a - 2b = 12$$

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14. The sum of three consecutive **odd** numbers is 177.  
Find the three numbers.

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15. The base of a triangle is  $x + 2 \text{ cm}$  and its height is  $5 \text{ cm}$ .  
The side of a square is  $x - 3 \text{ cm}$ .



- (a) Write an expression for the area of the triangle.
- (b) Write an expression for the perimeter of the square.
- (c) Given that the *area of the triangle* is  $4 \text{ cm}^2$  **less** than the *perimeter of the square*, form an equation in  $x$  and solve it to find  $x$ .
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16. The point T is at the top of a vertical cliff. From a car which is at a point A,  $45 \text{ m}$  due east of T, the angle of elevation of T is  $28^\circ$ . The car (from A) now travels  $23 \text{ m}$  due west to a point B.

- (a) Draw a diagram to represent the positions of the above points.

Calculate:

- (b) the height of the cliff, in  $\text{m}$ , to the nearest meter,
- (c) the angle of elevation of T from B in degrees to the nearest degree.
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17. A helicopter flies  $12 \text{ km}$  on a bearing of  $125^\circ$  to point A. It then changes course and flies  $22 \text{ km}$  on a bearing of  $35^\circ$  to a point B.

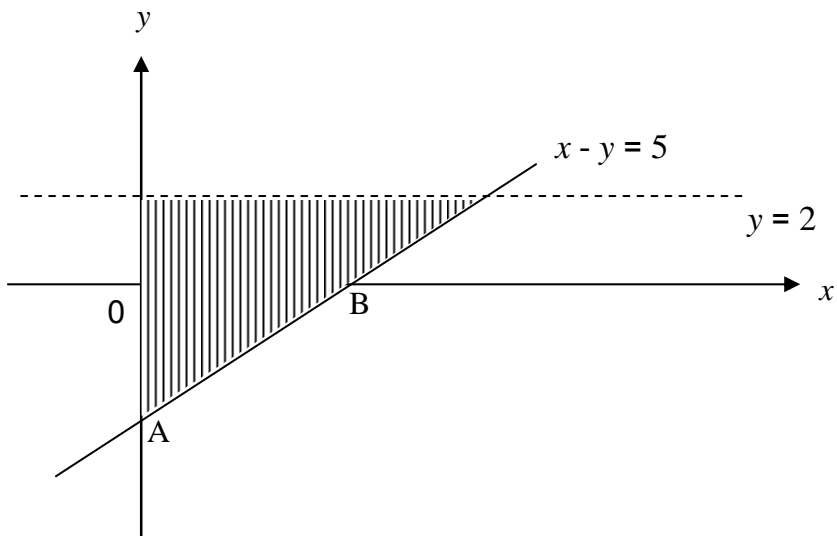
- (a) Draw a diagram to represent the above information.
- (b) How far is the helicopter due east of its starting point?
- (c) How far is the helicopter due north of its starting point?
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18. Find the range of values of  $x$  which satisfy the following inequalities

$$4x - 11 \leq x + 1 < \frac{3x + 8}{2}$$

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19.



Using the above graph:

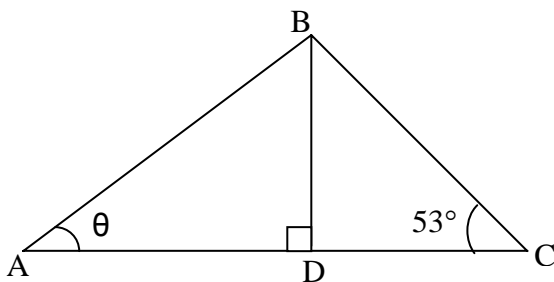
- (a) find the coordinates of the points A and B,
- (b) use inequalities to describe the shaded region.

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20. In the triangle ABC,  $AD = 22\text{cm}$ ,  $BC = 13\text{cm}$  and  $\angle BCD = 53^\circ$ .

Calculate:

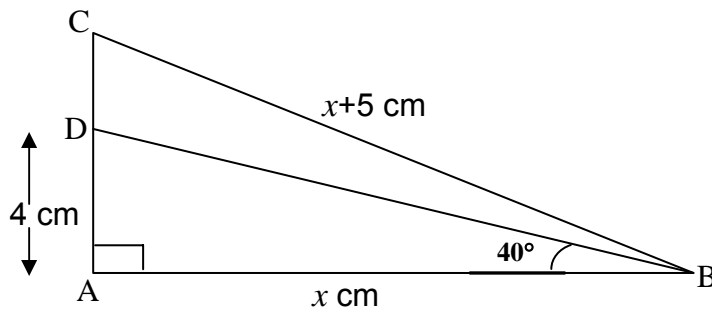
- (a) the length BD, correct to 3 significant figures,
- (b) the angle BAC to nearest degree,
- (c) the area of the triangle, to the nearest  $\text{cm}^2$ .



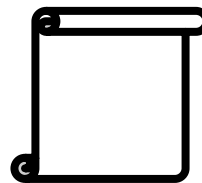
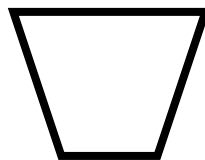
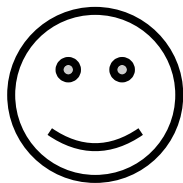
21. In the triangle below,  $\hat{A} = 90^\circ$ ,  $\hat{ABD} = 40^\circ$ ,  $AD = 4 \text{ cm}$ ,  $AB = x \text{ cm}$  and  $BC = (x + 5) \text{ cm}$ .

Give all your answers correct to 1 decimal place.

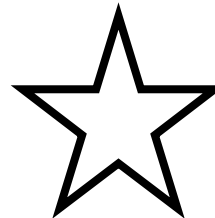
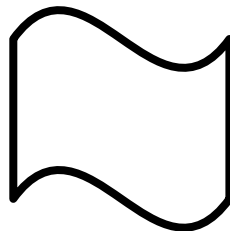
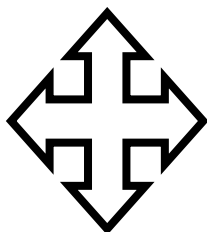
- (a) Find the value of  $x$ .
- (b) Find the angle  $ACB$ .
- (c) Find the length  $AC$ .
- (d) Find the area of the triangle  $BCD$ .



22. Draw the lines of symmetry on the diagrams and write the number of rotational symmetry.



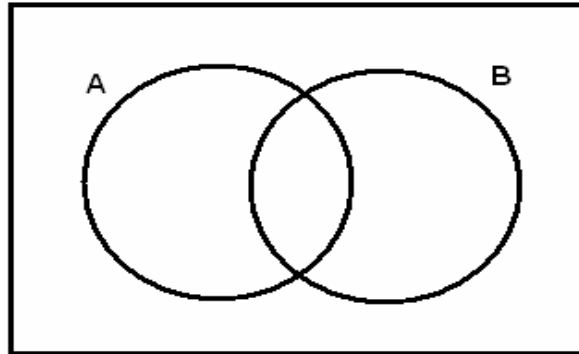
Rotational Symmetry \_\_\_\_\_



Rotational Symmetry \_\_\_\_\_

23.  $E = \{ \text{Positive integers less than 15} \}$   
 $A = \{ \text{Even Numbers} \}$   
 $B = \{ \text{Multiples of 3} \}$

(a) Enter the above information on the diagram below:



- (b) List the members of each of the following sets:  
(i) A  
(ii) B
- (c) Find: (i)  $A \cap B$ , (ii)  $(A \cup B)'$ , (iii)  $n(A' \cap B)$ .

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24. In a class of 24 students, 22 have mobile phone and 10 have a portable DVD player. One student has neither.

- (a) Draw a Venn diagram to show this information. Show the number of students in each region.
- (b) How many students have:  
(i) a mobile phone only?  
(ii) a portable DVD player only?  
(iii) both a mobile phone and a portable player?
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