NAME	MARK
TEACHER	
CLASS	PERCENTAGE

HERZLIA MIDDLE SCHOOL

GRADE 9

MATHEMATICS EXAMINATION

PAPER 1

17 NOVEMBER 2016

TIME: 90 Minutes

MARKS: 100

This paper consists of 14 pages

- ✡ All working details must be shown clearly.
- ✡ Marks will be deducted if work is set out incorrectly.
- ✡ Please note that diagrams are not necessarily drawn to scale.
- ✡ Calculators may be used.
- ✡ Unless convention or instructions dictate otherwise, round answers to two decimal places.
- ✡ It is in your own interest to write legibly and to present your work neatly

Question 1

1.1 From the list of numbers and table below, give all the numbers which are represented by: (5)

1.1.1 A:

1.1.2 B:

1.1.3 C:

1.1.4 D:

1.1.5 E:

$\sqrt{9}$ 5 $\frac{1}{3}$ $\sqrt{\frac{16}{25}}$ $\frac{8}{2}$ $\sqrt[3]{-27}$ $\sqrt{-4}$ $\frac{22}{7}$ $\sqrt{5}$ $\frac{\pi}{\pi}$

Number	Non-Real	Real	Irrational	Rational	Integer	Whole	Natural
A	×	✓	×	✓	×	×	×
B	×	✓	✓	×	×	×	×
C	×	✓	×	✓	✓	✓	✓
D	✓	×	×	×	×	×	×
E	×	✓	×	✓	✓	×	×

1.2 Does zero fit into any of these categories? If yes, state which one. (1)

Question 2

2.1 The Earth moves in its orbit around the sun at a speed of about 107 000 km/hr.

2.1.2 Calculate how far the Earth travels in one full day. (1)

2.1.3 Calculate the distance that the Earth travels in one year of $365\frac{1}{4}$ days.
Write your answer in Scientific Notation, rounded off to 2 decimal places. (2)

2.2 Simplify the following, leaving your answer in Scientific Notation.
Do not use a calculator. Show all steps of working. (2)

$$\frac{(2,5\times10^{3})(6\times10^{4})}{3\times10^{8}}$$

Question 3

Factorise the following.

3.1 $15a^3b + 45ab$ (1)

3.2 $x^2 - 11x - 26$ (2)

3.3 $2x^3y - 14x^2y^2 + 12xy^3$ (3)

3.4 $4(a+b) - x^2(a+b)$ (2)

3.5 $\dfrac{x^2 - 49}{7x^2 + 49x} \div \dfrac{2x - 14}{21x}$ (4)

3.6 $\dfrac{2x^2-18}{2x^2+6x}\times\dfrac{(x-1)^2-1}{x^2-5x+6}$ (7)

Question 4

Simplify the following leaving your answer with positive exponents where necessary. Do not use a calculator. Show all working.

4.1 $\sqrt[3]{\dfrac{27}{8}}+\sqrt{2\dfrac{1}{4}}$ (2)

4.2 $\dfrac{-3x^0y^{-2}}{15x^{-3}y^4}$ (2)

4.3 $\dfrac{(5x^{-3}y)^2}{-4xy} \div \dfrac{\sqrt{25x^4y^{-2}}}{2x^3}$ (4)

4.4 $(x-3)(5x+4)-5(x+4)^2$ (4)

4.5 $\frac{2}{3} - \frac{1}{2}(3x-2) - \frac{3}{4}(2x+5)$ (4)

Question 5

Solve for the unknown variable in the following equations.

5.1 $5(2y-1) = 9(y+1) - 8$ (3)

5.2 $2x^3 + 1 = 55$ (2)

5.3 $7^{x-2} = 1$ (2)

5.4 $\frac{x+3}{4}-\frac{x+2}{8}=\frac{x}{2}-1$ (4)

5.5 $5x^2-125=0$ (2)

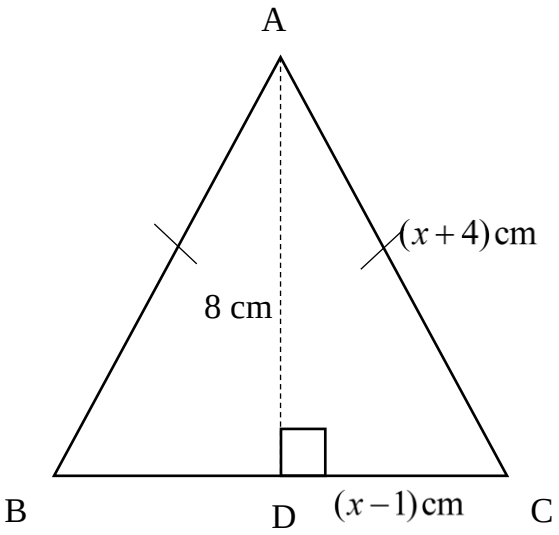
5.6 $2x^2-2x=24$ (3)

Question 6

6.1.1 Jordan decided to sell bracelets for R90, earrings for R120 and necklaces for R140. She sold $\frac{1}{3}$ as many bracelets as necklaces and 3 more earrings than bracelets. In total she made R1 620. How many necklaces did Jordan sell? (4)

6.1.2 If it cost Jordan R520 to make all the jewellery, calculate her percentage profit rounded off to the nearest whole percent. (2)

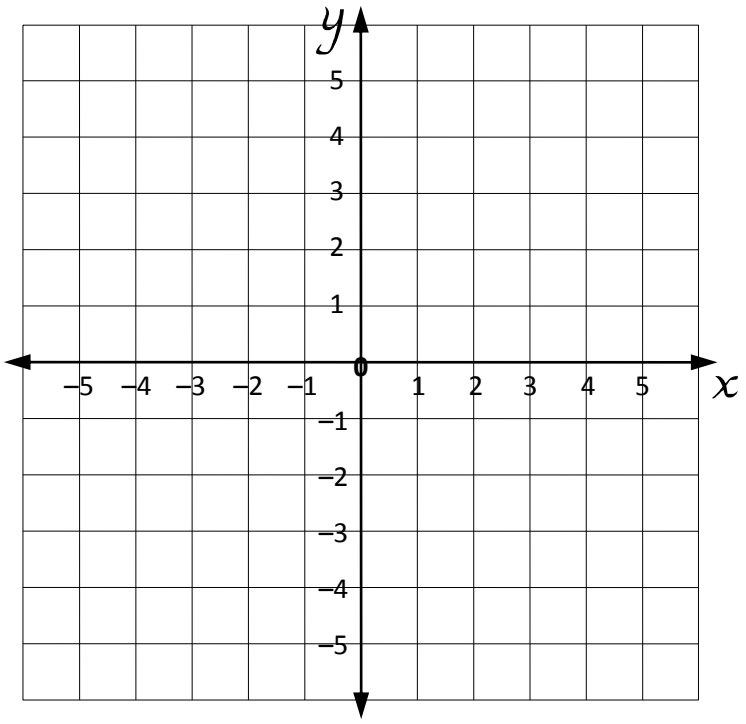
Question 7



7.1 ΔABC is an isosceles triangle with AC = $(x+4)$ cm, AD = 8cm , and DC = $(x-1)$ cm. Use the theorem of Pythagoras to determine the value of *x*. (5)

7.2 Hence, calculate the area of ΔABC. (3)

Question 8



8.1 Plot the following lines on the Cartesian plane above:

$f:\ y=\frac{3}{2}x+2$ (2)

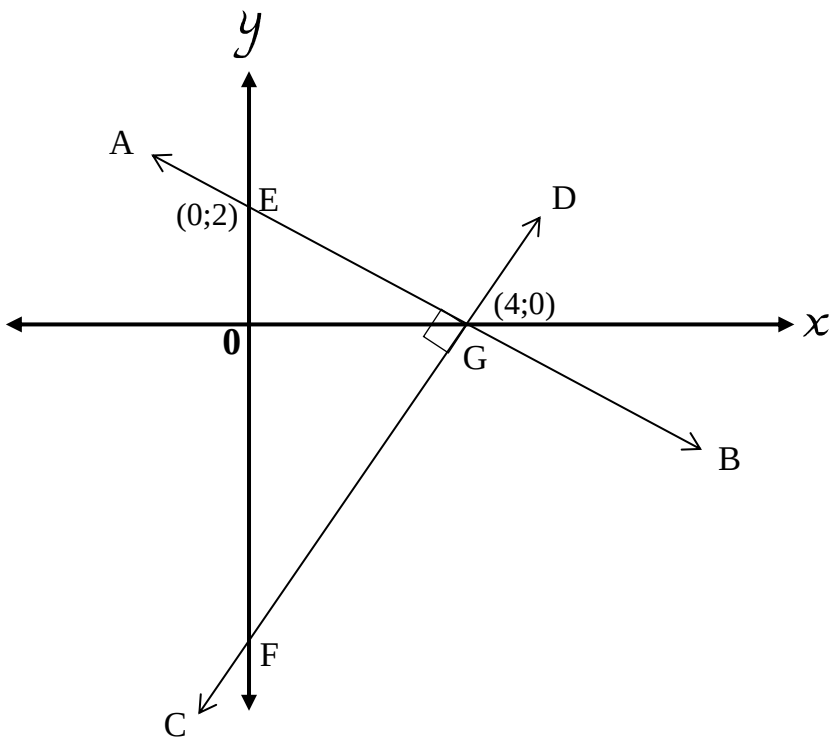
$g:\ x=1$ (1)

$h:\ -3=2x+3y$ (5)

8.2 Write down the point of intersection of *f* and *g*. (1)

8.3 Classify the triangle enclosed by line *f*, *g*, and *h*. (1)

Question 9

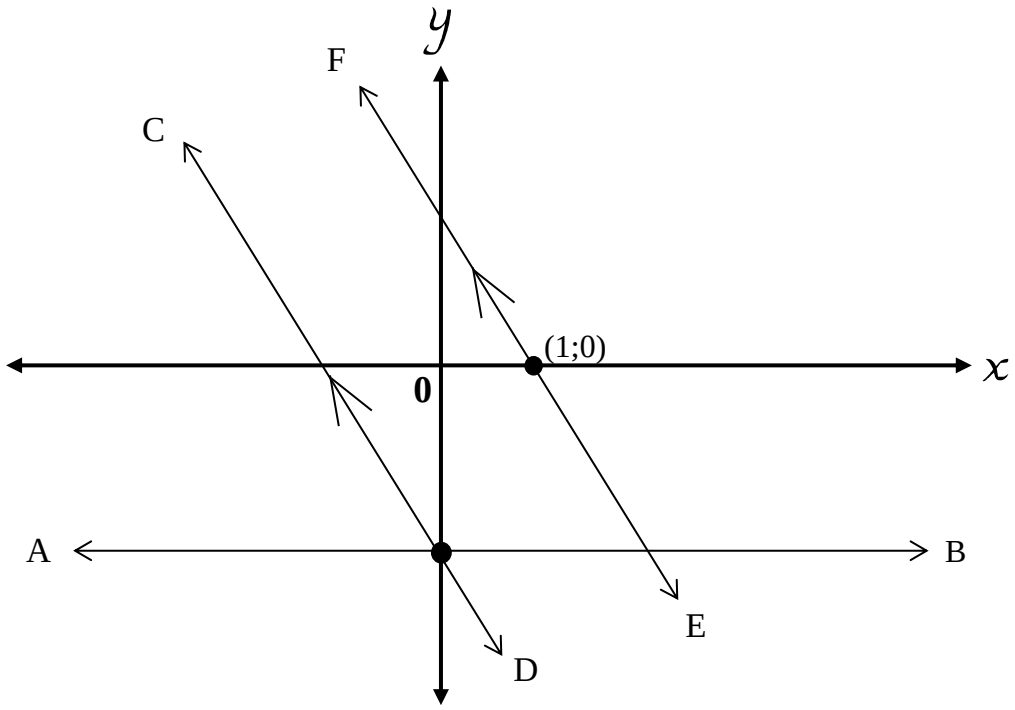


9.1 What is the equation of line AB? (2)

9.2 If $CD \perp AB$ what is the equation of CD? (3)

9.3 Calculate the area of ΔEFG (2)

Question 10



10.1 If the equation of line CD is $2y = -6x - 8$, determine the equation of AB (2)

10.2 Determine the equation of EF (3)

10.3 Determine the point of intersection of line EF and AB. (2)

Bonus Questions

1. If $x^2 + y^2 = 10$ and $xy = 3$, what is the value(s) of $x + y$? (2)

2. A train travelling at 60 km/hr takes 15 seconds to pass you. How long is the train? (1)

3. Three coins are tossed at the same time. What is the probability of two tails and one head showing? (1)