



Hillel Academy High School

Mid Year Examinations

February 2014

Grade 9 Mathematics

Paper 2

1 Hour

READ THESE INSTRUCTIONS FIRST

- ↻* Answer all questions. The number of marks is at the end of each question or part question.
- ↻* Write your answers and working on this paper. You may write in pen (dark blue or black ink).
- ↻* All working **must be** clearly shown. Marks will be given for working even if you get the final answer wrong.
- ↻* The total number of the marks for this paper is **55**.

Name:

Total

55

1. Tickets for the theatre cost either \$10 or \$16.

a. Calculate the total cost of 197 tickets at \$10 each and 95 tickets at \$16 each.

Answer..... [1]

b. On Monday, 157 tickets at \$10 and n tickets at \$16 were sold. The total cost was \$4018. Calculate the value of n .

Answer..... [2]

c. On Tuesday, 319 tickets were sold altogether. The total cost was \$3784. Using x for the number of \$10 tickets sold and y for the number of \$16 tickets sold, write down two equations in x and y .

Solve your equations to find the number of \$10 tickets and the number of \$16 tickets sold.

Answer..... [5]

d. On Wednesday, the cost of a \$16 ticket was reduced by 15%. Calculate this new reduced cost.

Answer..... [2]

e. The \$10 ticket costs 25% more than it did last year. Calculate the cost last year.

Answer..... [2]

2. Find the values of k , m and n in each of the following equations, where $a > 0$.

a. $a^0 = k$

Answer..... [1]

b. $a^m = \frac{1}{a}$

Answer..... [1]

c. $a^n = \sqrt{a^3}$

Answer..... [1]

3. The length, y , of a solid is inversely proportional to the square of its height, x .
- a. Write down a general equation for x and y .
Show that when $x = 5$ and $y = 4.8$ the equation becomes $x^2y = 120$.

Answer..... [2]

- b. Find y when $x = 2$.

Answer..... [1]

- c. Find x when $y = 10$.

Answer..... [2]

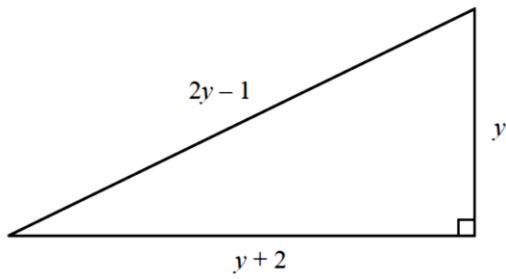
- d. Find x when $y = x$.

Answer..... [2]

- e. Make x the subject of the formula $x^2y = 120$.

Answer..... [2]

4.



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SCALE

The diagram shows a right-angled triangle.
The lengths of the sides are given in terms of y .

Show that $2y^2 - 8y - 3 = 0$.

Answer:

[3]

5. Change the following recurring decimals to fractions.

a. $0.5555 \dots$

Answer..... [1]

b. $0.02444 \dots$

Answer..... [2]

6. $y = m^2 - 4n^2$.

a. Factorise $m^2 - 4n^2$

Answer..... [1]

b. Find the value of y when $m = 4.4$ and $n = 2.8$.

Answer..... [1]

c. $m = 2x + 3$ and $n = x - 1$

Find y in terms of x , in its simplest form.

Answer..... [2]

d. Make n the subject of the formula $y = m^2 - 4n^2$.

Answer..... [2]

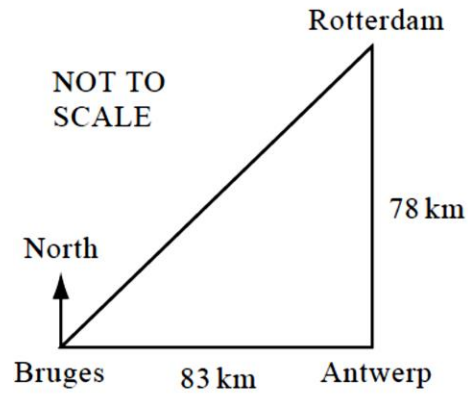
e. (i) $m^4 - 16n^4$ can be written as $(m^2 - kn^2)(m^2 + kn^2)$.

Answer..... [2]

(ii) Factorise completely $m^4n - 16n^5$

Answer..... [2]

7.



Antwerp is 78 km due South of Rotterdam and 83 km due East of Bruges, as shown in the diagram.

Calculate

- a. distance between Bruges and Rotterdam.

Answer..... [2]

- b. The bearing of Rotterdam from Bruges, correct to the nearest degree.

Answer..... [3]

8. Solve the following equations.

a. $\frac{5}{w} = \frac{3}{w+1}$

Answer..... [2]

b. $(y + 1)^2 = 4$

Answer y.....or y..... [2]

c. $\frac{x+1}{3} - \frac{x-2}{5} = 2$

Answer..... [3]

9. From the top of a tower of height 75 m , a guard sees two prisoners, both due west of him. If the angles of depression of the two prisoners are 10° and 17° , calculate the distance between them.

Answer..... [3]

END OF TEST