

Student Name: _____	Grade: _____
Date: _____	Score: _____

- Answer the questions in the spaces provided on the question sheets.
- If you run out of room for an answer, continue on the back of the page.
- This test has 19 questions, for a total of 100 marks.
- Attempt all 19 questions.
- Time allowed: 45 minutes.

Page:	1	2	3	4	5	6	7	Total
Points:	20	20	12	8	14	16	10	100
Score:								

This edition was printed on October 7, 2008.

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Index laws — (Questions 1 through 6)

Question 1 (10 marks)

Express each of the following expressions in index form:

(a) $3 \times 5 \times 5 \times 5 \times 3 \times 3$ [2]

(a) _____

(b) $5 \times c \times c \times c + 2 \times d \times d \times d \times 3$ [2]

(b) _____

(c) 800 [2]

(c) _____

(d) eight factors of seven [2]

(d) _____

(e) x factors of nine [2]

(e) _____

Question 2 (10 marks)

Simplify the following expressions:

(a) $(a^4 \times a^5 \div a^2)^4$ [2]

(a) _____

(b) $8^\circ + (8b)^\circ + 8b^\circ$ [2]

(b) _____

(c) $\frac{(3y^4)^2 \times 5x^{10}}{x^3 \times (3x^3)^2 \times x^5}$ [2]

(c) _____

(d) $(5x^2y^3)^{-3}$ [2]

(d) _____

(e) $\left(\frac{x^3}{x^2}\right)^4 \times \left(\frac{x^4}{x^2}\right)^{-2}$ [2]

(e) _____

Question 3 (6 marks)

Find the value of n in each of these:

(a) $\frac{1}{5} = 5^n$ [2]

(a) _____

(b) $\frac{1}{64} = 2^n$ [2]

(b) _____

(c) $\frac{1}{49} = 7^n$ [2]

(c) _____

Question 4 (6 marks)

Evaluate the following:

(a) $(\frac{9}{49})^{\frac{1}{2}}$ [2]

(a) _____

(b) $\sqrt[3]{27x^{12}}$ [2]

(b) _____

(c) $(64x^{18})^{\frac{1}{3}}$ [2]

(c) _____

Question 5 (4 marks)

Simplify the following:

(a) $27^{-\frac{1}{3}}$ [2]

(a) _____

(b) $10000^{-\frac{1}{4}}$ [2]

(b) _____

Question 6 (4 marks)

Evaluate each of these:

(a) if $2^n = 5$, find 2^{2n+4} [2]

(a) _____

(b) if $5^n = 500$, find 5^{2n-4} [2]

(b) _____

Polygon — (Questions 7 through 8)

Question 7 (4 marks)

How many sides are there in a regular polygon whose exterior each measure:

(a) 30° [2]

(a) _____

(b) 15° [2]

(b) _____

Question 8 (4 marks)

A regular polygon has 12 sides.

(a) Find the size of the exterior angles. [2]

(a) _____

(b) Hence, find the size of the interior angles. [2]

(b) _____

The Linear Function — (Questions 9 through 11)

Question 9 (4 marks)

Find the distance between each pair of points, correct your answer to 2 decimal places.

(a) (-8, -6) and (-6, -4) [2]

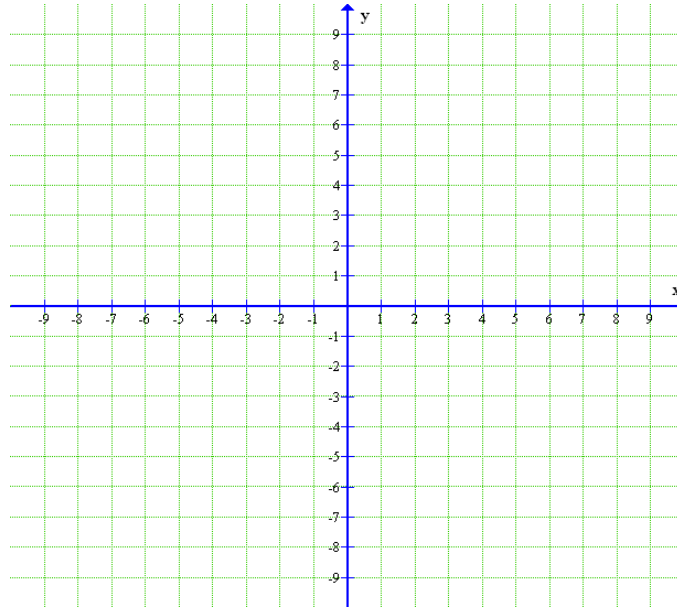
(a) _____

(b) (-2, 8) and (2, -8) [2]

(b) _____

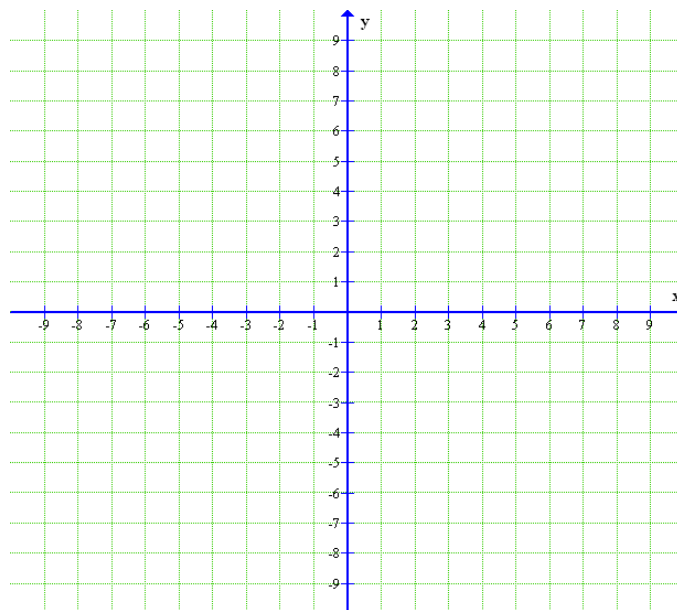
Question 10 (4 marks)

Draw the graph of the line $y = 3x - 1$ using a table of values.



Question 11 (4 marks)

Find the x and y intercepts and hence sketch the line $2x + 2y = 16$.



Trigonometry — (Questions 12 through 14)

Question 12 (6 marks)

Evaluate each of these expressions, correct to 2 decimal places:

(a) $25\cos 46^\circ$ [2]

(a) _____

(b) $\frac{25}{\sin 28^\circ}$ [2]

(b) _____

(c) $\frac{\sin 22^\circ + \cos 42^\circ}{\tan 52^\circ}$ [2]

(c) _____

Question 13 (4 marks)

If $\tan \theta = 0.3249$, find correct to 2 decimal places the value of:

(a) $\sin \theta$ [2]

(a) _____

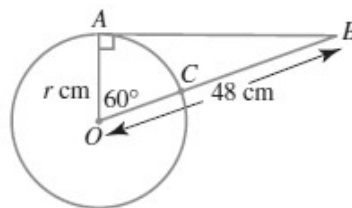
(b) $\cos \theta$ [2]

(b) _____

Question 14 (4 marks)

AB is a tangent to a circle with centre O. The interval OB is 48 cm long and cuts the circle at C.

Find:



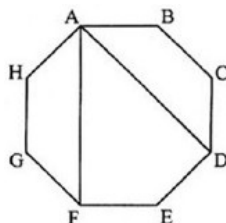
(a) the length of the radius, r in cm. [2]

(b) the length of interval BC. [2]

Problem Solving — (Questions 15 through 18)

Question 15 (5 marks)

The figure shown below is a regular octagon. Find the $\angle DAF$.



15. _____

Question 16 (6 marks)

John walked on a bearing of 295° from home (H) to a local park (P) to meet his friend. Together they walked on a bearing of 205° to the beach (B), which is 380 m due west of John's home.

(a) Show that $\angle HPB = 90^\circ$ [3]

(a) _____

(b) Find, correct to the nearest metre, the distance between John's home and the park. [3]

(b) _____

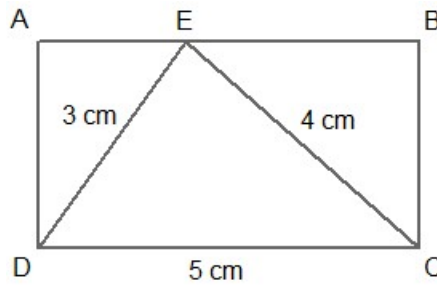
Question 17 (5 marks)

In the isosceles $\triangle FGH$, $FG = GH = 56$ cm and $\angle FHG = 65^\circ$. Find the length of FH, correct to 2 decimal places.

17. _____

Question 18 (5 marks)

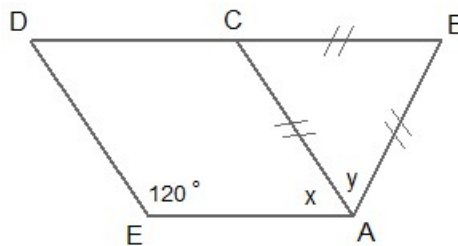
In the rectangle ABCD shown below, DC = 5 cm. E is a point on AB such that DE = 3 cm and EC = 4 cm. Find the perimeter of the rectangle ABCD.



18. _____

Question 19 (5 marks)

The figure shown below made up of a rhombus and an equilateral triangle. Find the value of $\angle x + \angle y$.



19. _____