

# PYTHAGORAS QUEST

Matematiktävling för

högstadiel elever



Handelskammaren  
I sydsvenska företags intresse

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## Qualification Round 2016

Time : **60 mins**

No of Questions: **15**

Max: **15 points.**

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**1.**

If  $a^2 = 4$ , what is  $a^6$  ?

- (A) 12    (B) 16    (C) 24    (D) 32    (E) 64

**2.**

A 2-digit number is such that the product of the digits plus the sum of the digits is equal to the number. What is the units digit of the number?

- (A) 1    (B) 3    (C) 5    (D) 7    (E) 9

**3.**

Patrik, Sam and Martin got some candy eggs at a party. Patrik had three times as many eggs as Sam, and Sam had twice as many eggs as Martin. Patrik decides to give some of his eggs to Sam and Martin so that all three will have the same number of eggs. What fraction of his eggs should Patrik give to Sam?

- (A)  $\frac{1}{12}$     (B)  $\frac{1}{6}$     (C)  $\frac{1}{4}$     (D)  $\frac{1}{3}$     (E)  $\frac{1}{2}$

4.

Ulf teaches math to 15 students. He was grading tests and found that when he graded everyone's test except Pierre's, the average grade for the class was 80. After he graded Pierre's test, the test average became 81. What was Pierre's score on the test?

- (A) 81      (B) 85      (C) 91      (D) 94      (E) 95

5.

The sum of two positive numbers is 5 times their difference. What is the ratio of the larger number to the smaller number?

- (A)  $\frac{5}{4}$       (B)  $\frac{3}{2}$       (C)  $\frac{9}{5}$       (D) 2      (E)  $\frac{5}{2}$

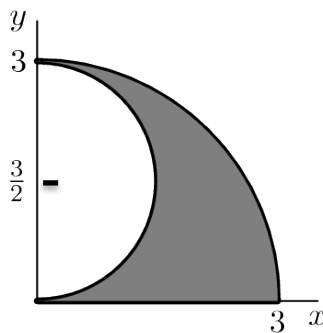
6.

The 7-digit numbers  $\underline{74A52B1}$  and  $\underline{326AB4C}$  are each multiples of 3. Which of the following could be the value of C?

- (A) 1      (B) 2      (C) 3      (D) 5      (E) 8

7.

What is the shaded area in the figure below?



- (A)  $\frac{4\pi}{5}$       (B)  $\frac{9\pi}{8}$       (C)  $\frac{4\pi}{3}$       (D)  $\frac{7\pi}{5}$       (E)  $\frac{3\pi}{2}$

8

What is  $\frac{10}{\left(\frac{1}{2} + \frac{1}{5} + \frac{1}{10}\right)}$  ?

- (A) 3      (B) 8      (C)  $\frac{25}{2}$       (D)  $\frac{170}{3}$       (E) 170

9.

Suppose that  $a$  cows give  $b$  gallons of milk in  $c$  days. At this rate, how many gallons of milk will  $d$  cows give in  $e$  days?

- (A)  $\frac{bde}{ac}$       (B)  $\frac{ac}{bde}$       (C)  $\frac{abde}{c}$       (D)  $\frac{bcde}{a}$       (E)  $\frac{abc}{de}$

10

In a right-angled triangle with right angle ACB,  $AC = 2\sqrt{3}$  and  $BC = 6$ . What is the triangle's height from base AB?

- (A) 2      (B)  $2\sqrt{2}$       (C) 3      (D)  $3\sqrt{3}$       (E) 4

11

Five consecutive positive whole numbers starting with the number  $a$ , have average  $b$ . What is the average of five consecutive positive whole numbers starting from  $b$ ?

- (A)  $a + 3$       (B)  $a + 4$       (C)  $a + 5$       (D)  $a + 6$       (E)  $a + 7$

**12.**

During the first 30 minutes of a journey, Dora drove at a constant speed. During the following 30 minutes, she drove at a constant speed, but 20 km/h faster. If her total distance travelled was 100 km, how fast did she travel in the first 30 minutes?

(A) 80 km/h (B) 90 km/h (C) 100 km/h (D) 110 km/h (E) 120 km/h

**13.**

My daughter is turning 5 in October this year (2016). This year her birthday is on a Saturday. Great fun! But how many more birthdays will fall on a Saturday up to and including her 18th birthday? (If the year is divisible by 4 then it is a leap year and there are 366 instead of 365 days in the year. The extra day is added in February)

(A) 0 (B) 1 (C) 2 (D) 3 (E) 4

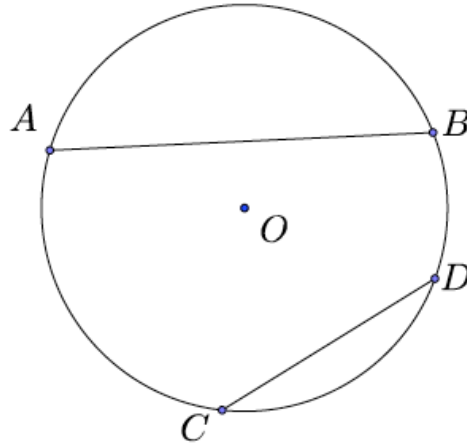
**14.**

One day the Pythagoras Kiosk sold 252 cans of soda to 100 customers, and every customer bought at least one can of soda. What is the maximum possible median number of cans of soda bought per customer on that day?

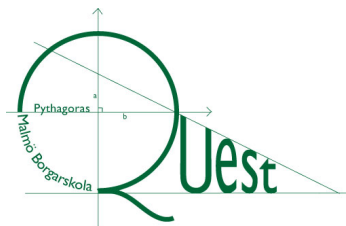
(A) 2.5 (B) 3.0 (C) 3.5 (D) 4.0 (E) 4.5

15.

In the circle below with centre  $O$ ,  $AB$  and  $CD$  are chords of the circle. Chord  $AB$  has length 22 and chord  $CD$  length 16. If chord  $CD$  is twice as far from  $O$  as chord  $AB$ , what is the radius of the circle?



- (A) 12    (B)  $2\sqrt{35}$     (C) 13    (D) 14    (E)  $10\sqrt{2}$



# PYTHAGORAS QUEST



## Matematiktävling för högstadiel elever

### Pupil Answer sheet

Mark your choice with a letter in the column labelled "Answer".  
Remember, only one letter per question.  
Correct answer gives 1 point. Wrong or blank answers give zero!

Name: \_\_\_\_\_ Class: \_\_\_\_\_ School: \_\_\_\_\_

Question	Answer (pupil's answer)	points (teacher)
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Antal poäng =>		