Kursprov, höstterminen 2015

Mathematics

Delprov B

1c

Elevens namn och klass/grupp

Skolverket

Instructions – Part B

Time for the test

60 minutes for Part B.

Aids

Allowed aids on Part B are formula sheet and ruler.

Tasks

This part consists of tasks to be solved without using digital devices. Answers and solutions are to be written in the test booklet. Some of the tasks require working, which is to be shown in the figure and the box next to the task. For the other tasks only the answer is required. The maximum number of points that you can get for your answer/solution is shown after each task.

Grading limits

The test (Part A–D) gives a total maximum of 89 points.

Limit for test grade

E: At least 19 points.
D: At least 35 points of which at least 15 points at level C or higher.
C: At least 44 points of which at least 23 points at level C or higher.
B: At least 59 points of which at least 9 points at level A.
A: At least 70 points of which at least 16 points at level A.

Name: _____

Date of birth: _____

Programme: _____ Class: _____

Illustration: Jens Ahlbom

1. Solve the equation $2(3x - 18) = 0$

Answer: $x =$ _____ (1/0/0)

2. By what percentage have the prices risen between 2010 and 2014 according to the table?

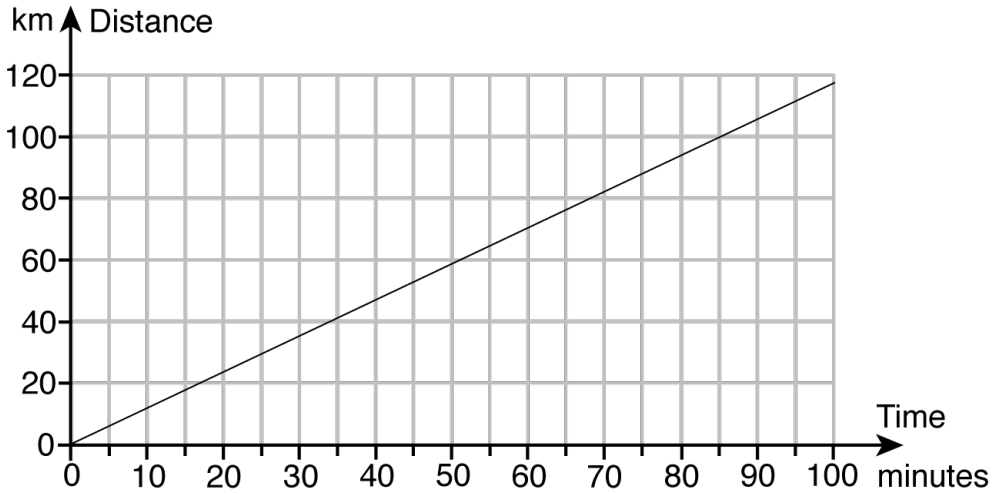
Year	**2010**	**2014**
CPI (Consumer Price Index)	100	103

Answer: _____ % (1/0/0)

3. Simplify the expression $2x(x + 3) - x$ as far as possible.

Answer: _____ (1/0/0)

4. The diagram shows how far a person travels within a given time at a speed of 70 km/h.



a) Draw the corresponding graph in the diagram for the speed of 90 km/h. (1/0/0)

b) When Johan drives to work, he has an average speed of 90 km/h. It takes approximately 40 minutes. Determine, using the diagram, how much longer it would take to drive the same route if his average speed was instead 70 km/h. Show your solution.

Answer: _____ min (1/1/0)

5. All of the jackets in a shop are sold at a 40 % discount.
You pay SEK 1 200 for a jacket.
How much did it cost before the discount?

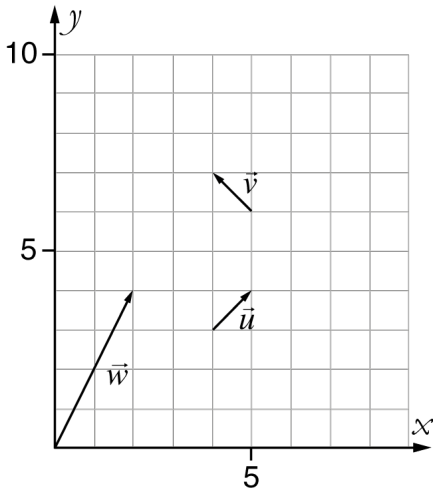
Answer: SEK _____ (0/2/0)

6. Circle the powers that have the same value.

0^5 1^4 2^3 3^2 4^1 5^0 (0/1/0)

7. Solve the equation $4 \times x^3 = 256$ Answer: $x =$ _____ (0/1/0)

8. Representations of the vectors $\vec{u}$, $\vec{v}$ and $\vec{w}$ are given in the coordinate system.



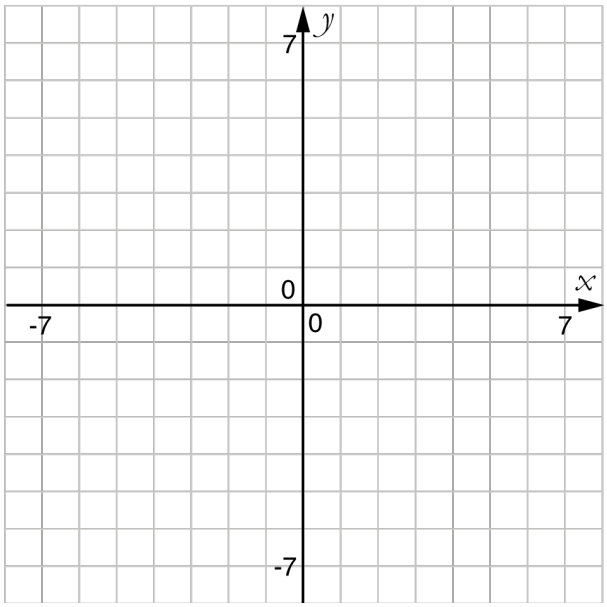
a) Write an expression for the vector $\vec{w}$ using the vectors $\vec{u}$ and $\vec{v}$. Answer: _____ (0/1/0)

b) Determine the exact length (absolute value) of the vector $\vec{w}$. Show your solution.

Answer: _____ units (0/2/0)

9. Draw a possible graph for the function f in the coordinate system below.
For function f it is given that:

- The domain is $-5 \leq x \leq 6$
- $f(-3) = 0$
- The range is $-2 \leq f(x) \leq 4$



(1/1/1)

10. Following statements are equivalences or implications. Mark statements that are equivalences with symbol ⇔ and statements that only are implications with symbol ⇒ or ⇐.

The integer, x, ends with the digit zero	☐	The integer, x, is divisible by two
$y \geq 2$	☐	$y > 2$
$2z + 4 = 6$	☐	$z = 1$

(0/1/1)

11. Solve the equation $3^x = 9^{100}$ Answer: $x =$ _____ (0/0/1)

12. What number is to be written in the empty box in the table?

x	xy	xy^2
2	-10	

Answer: $xy^2 =$ _____ (0/0/1)

13. A team is due to play 130 matches in a season.
After playing 80 matches, they have won 48 of them.
How many of the 50 remaining matches must the team win in order for the proportion of wins to be the same as after the first 80 matches?

Answer: _____ (0/0/1)

14. Write as an inequality: a is at least 4 more than b. Answer: _____ (0/0/1)

15. The function $f(x) = 2x - 3$ is given.

a) Determine $f(-2)$ Answer: _____ (1/0/0)

b) Simplify $f(a + 1) - f(a)$
Show the simplification.

(0/0/2)

16. The two shortest sides of a right triangle have the lengths of $\sqrt{3}$ and 2.
Let v be the smallest angle in the triangle. What is the value of $\sin v$?
Show your solution and circle your answer.

$\sqrt{\frac{3}{7}}$ $\sqrt{\frac{4}{7}}$ $\sqrt{\frac{3}{5}}$ $\sqrt{\frac{3}{4}}$ $\sqrt{\frac{4}{5}}$

(0/1/3)

Test result – Student summary

National test in mathematics, 1c autumn 2015

Name:	Test grade:

	E-points		C-points		A-points		Total	
	Your score	Maximum score	Your score	Maximum score	Your score	Maximum score	Your score	Maximum score
Part A		4		4		4		12
Part B		7		11		11		29
Part C		2		3		3		8
Part D		13		19		8		40
Total		**26**		**37**		**26**		**89**

Part A	**E**	**C**	**A**	**Score**	**Comment**
Method and carrying through	$+E_B$ $+E_B$	$+C_M$	$+A_M$		
Reasoning	$+E_R$	$+C_R$	$+A_R$		
	$+E_R$	$+C_R$	$+A_R$		
Communication		$+C_K$	$+A_K$		
Total	**4**	**4**	**4**		

Part C	**E**	**C**	**A**	**Score**	**Comment**
Method and carrying through	$+E_{PL}$ $+E_P$	$+C_P$	$+A_{PL}$		
Reasoning		$+C_R$	$+A_R$		
Communication		$+C_K$	$+A_K$		
Total	**2**	**3**	**3**		

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Test grade

The test grade sums up the knowledge that the student has shown on the national test. The course grade does not have to be the same as the test grade since the course grade is based on all the knowledge that the student has shown during the course.

Comments:

The form is available to download at www.su.se/primgruppen

PRIM gruppen