

AGA KHAN UNIVERSITY EXAMINATION BOARD

SECONDARY SCHOOL CERTIFICATE

CLASS X EXAMINATION

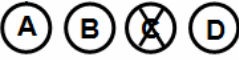
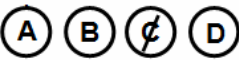
MAY 2015

Mathematics Paper I

Time: 40 minutes Marks: 30

INSTRUCTIONS

1. Read each question carefully.
2. Answer the questions on the separate answer sheet provided. DO NOT write your answers on the question paper.
3. There are 100 answer numbers on the answer sheet. Use answer numbers 1 to 30 only.
4. In each question there are four choices A, B, C, D. Choose ONE. On the answer grid black out the circle for your choice with a pencil as shown below.

Correct Way		Incorrect Ways	
1		1	
		2	
		3	
		4	

Candidate's Signature

5. If you want to change your answer, ERASE the first answer completely with a rubber, before blacking out a new circle.
6. DO NOT write anything in the answer grid. The computer only records what is in the circles.
7. You may use a simple calculator if you wish.

1. $\sqrt{a^2 + \frac{1}{a^2}} - 2$ is equal to

A. $\left(a + \frac{1}{a}\right)$

B. $\left(a - \frac{1}{a}\right)$

C. $\left(a^2 + \frac{1}{a^2}\right)$

D. $\left(a^2 - \frac{1}{a^2}\right)$

2. The least common multiple of $(x^3 - 1)$ and $(x^2 + x + 1)$ is

A. $x - 1$

B. $x^2 + x + 1$

C. $(x - 1)(x^2 + x + 1)$

D. $(x - 1)(x^2 + x + 1)^2$

3. The highest common factor of $25x$, $5x^2$ and $20x^3$ is

A. $5x$

B. $5x^2$

C. $25x^2$

D. $20x^3$

4. Which of the following is a proper rational fraction?

A. $\frac{x^2}{x - 1}$

B. $\frac{x^3}{x(x + 1)^2}$

C. $\frac{x^3 - 1}{(x + 1)(x - 1)^2}$

D. $\frac{(x - 1)(x + 1)}{x^3 - 1}$

5. If $p < q < 0$, where p and q are real numbers, then which of the following is TRUE?

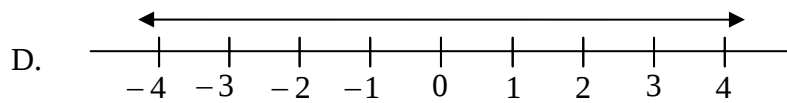
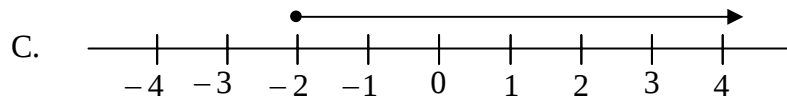
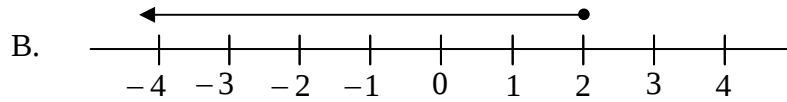
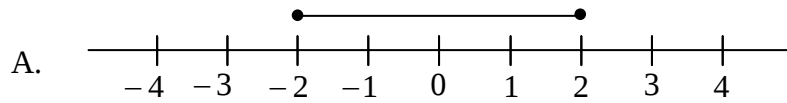
A. $pq < 0$

B. $pq > 0$

C. $pq \leq 0$

D. $pq \geq 0$

6. Which of the following number lines represent the correct solution of $|x| \leq 2$?



7. If $\sqrt{\frac{5-2x}{2}} = 0$, then the value of x is equal to

A. $\frac{5}{4}$

B. $\frac{5}{2}$

C. $\frac{4}{5}$

D. $\frac{2}{5}$

8. If $|2x - 3| = 1$, then the solution set is

A. $\{1\}$

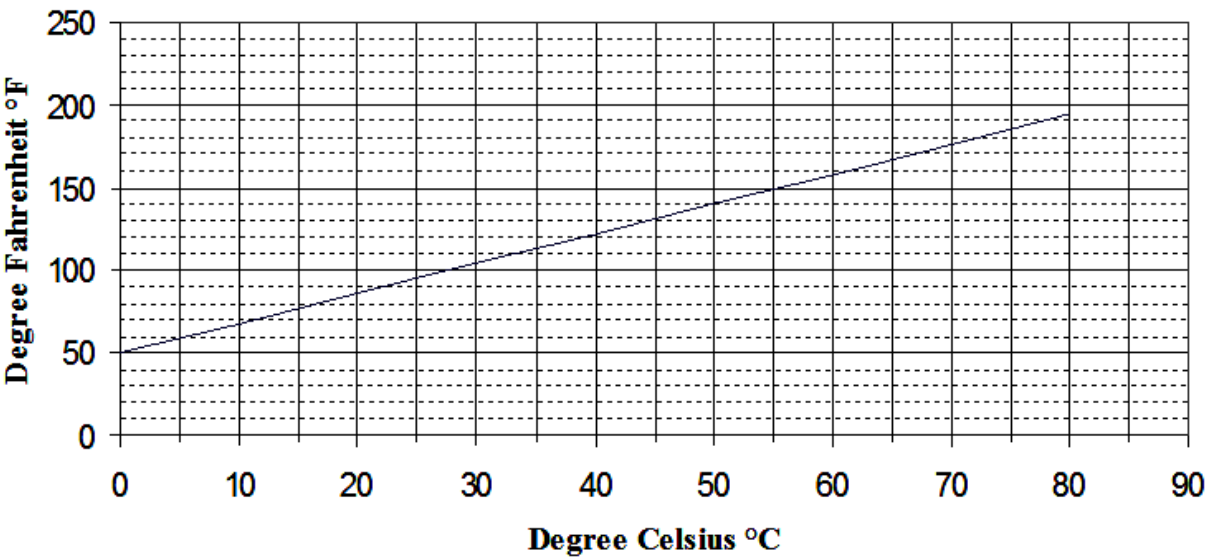
B. $\{2\}$

C. $\{1, 2\}$

D. $\{-1, -2\}$

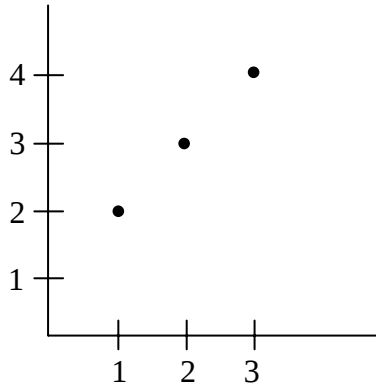
9. Based on the given graph, 45°C is equal to

Conversion Graph: Degree Fahrenheit - Degree Celsius

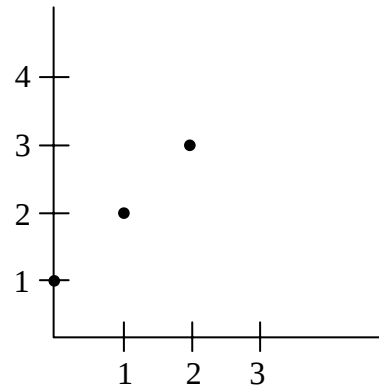


- A. 125 °F
- B. 130 °F
- C. 140 °F
- D. 145 °F

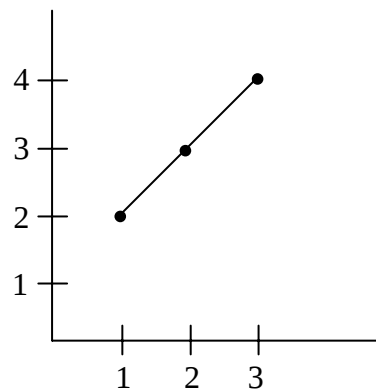
10. Which of the following is the graphical representation of $y = x + 1$, where x and y are natural numbers and $x \leq 3$?



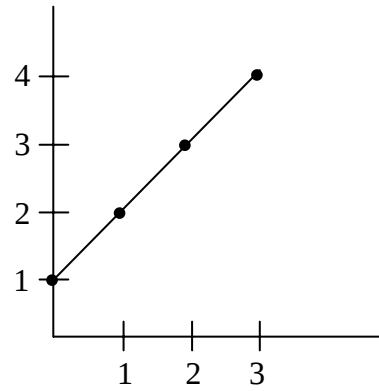
A



B



C

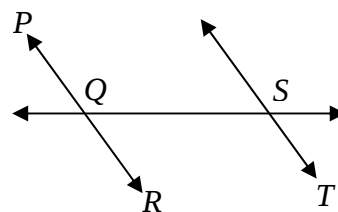


D

11. One of the points lying on the line $x - y = 3$ is
- A. $(-1, 2)$
 - B. $(-2, 1)$
 - C. $(-3, 0)$
 - D. $(0, -3)$
12. The standard form of $2x^2 - \frac{2}{7}x = \frac{3}{7}$ is
- A. $2x^2 - 2x - 3 = 0$
 - B. $2x^2 - 2x + 3 = 0$
 - C. $14x^2 - 2x - 3 = 0$
 - D. $14x^2 - 2x + 3 = 0$
13. If one root of $2x^2 - x = 0$ is 0, the other root is
- A. 2
 - B. $\frac{1}{2}$
 - C. $-\frac{1}{2}$
 - D. -2
14. What should be added to $x^2 + 5x$ to make it a perfect square?
- A. 5
 - B. 25
 - C. $\frac{5}{2}$
 - D. $\frac{25}{4}$
15. The point collinear to the points $(0, 0)$ and $(1, 1)$ is
- A. $(2, 2)$
 - B. $(2, 0)$
 - C. $(0, 1)$
 - D. $(1, -1)$

16. In the given figure, three collinear points are Q,

- A. P and R.
- B. R and S.
- C. P and S.
- D. S and T.

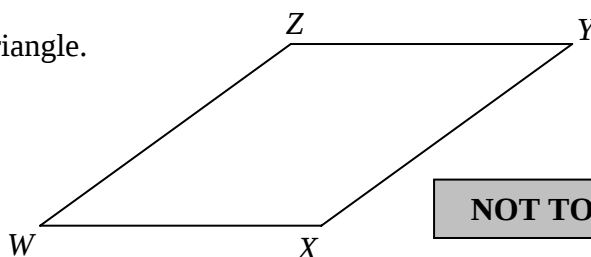


NOT TO SCALE

17. Which of the following is/ are TRUE for the given parallelogram?

- I. Point W, Y and Z are collinear.
- II. Point W, X and Z may form a triangle.
- III. $m\overline{WX} = m\overline{ZY}$

- A. II only
- B. I and II
- C. I and III
- D. II and III



NOT TO SCALE

18. If $\sin \theta < 0$ and $\cos \theta < 0$, then θ lies in the

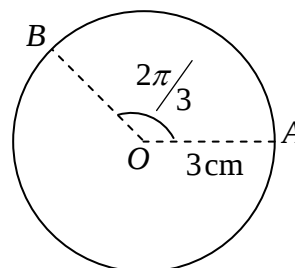
- A. 4th quadrant.
- B. 3rd quadrant.
- C. 2nd quadrant.
- D. 1st quadrant.

19. $30^\circ 30'$ is equal to

- A. 30.30°
- B. 30.03°
- C. 30.05°
- D. 30.5°

20. In the given circle with centre O, the length of circular arc AB is equal to

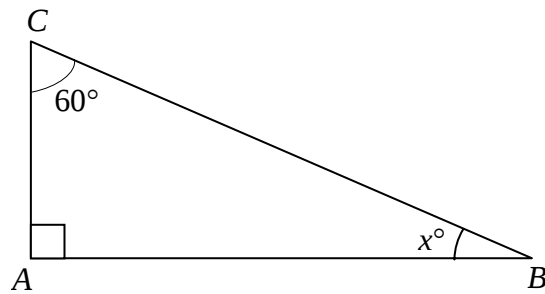
- A. $\frac{2\pi}{9}$ cm
- B. $\frac{9}{2\pi}$ cm
- C. 2π cm
- D. 9π cm



NOT TO SCALE

21. In triangle ABC , $\tan x^\circ$ is equal to

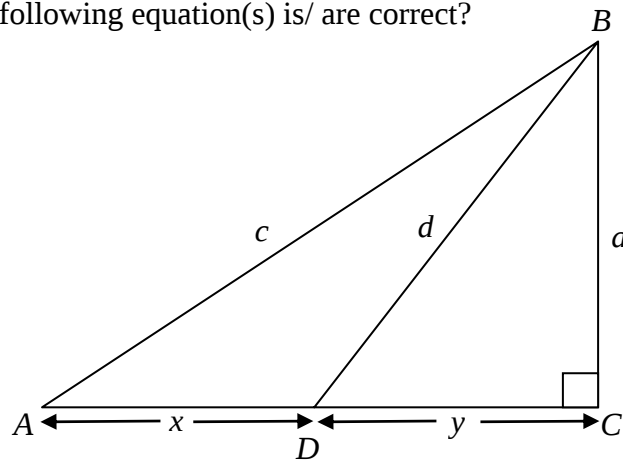
- A. 1
- B. $\sqrt{3}$
- C. $\frac{\sqrt{3}}{2}$
- D. $\frac{1}{\sqrt{3}}$



NOT TO SCALE

22. For the given triangle, which of the following equation(s) is/ are correct?

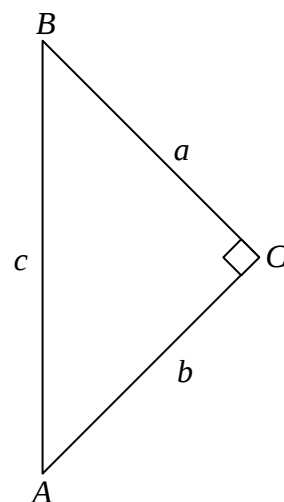
- I. $c^2 = a^2 + (x + y)^2$
 - II. $c^2 = d^2 + x^2$
 - III. $d^2 = a^2 + y^2$
- A. I only
 - B. III only
 - C. I and III
 - D. II and III



NOT TO SCALE

23. Which of the following set of values is possible for the given triangle?

- A. $a = 4, b = 5$ and $c = 3$
- B. $a = 5, b = 3$ and $c = 4$
- C. $a = 5, b = 12$ and $c = 13$
- D. $a = 13, b = 5$ and $c = 12$



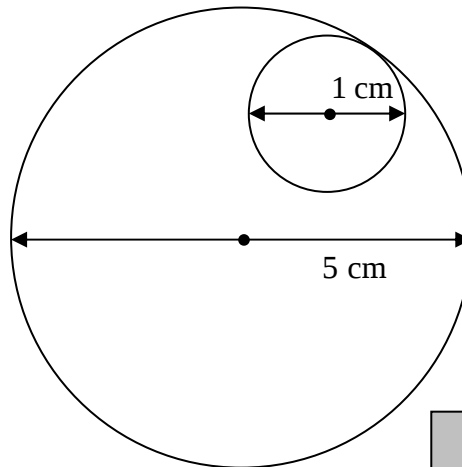
NOT TO SCALE

24. In a right-angled triangle if the length of the shortest and the longest sides are 6 cm and 10 cm respectively, then the length of the third side will be

A. 9 cm.
 B. 8 cm.
 C. 7 cm.
 D. 6 cm.

25. In the given figure, a circle of radius 1 cm touches a circle of radius 5 cm internally. The distance between the centres of the two circles is

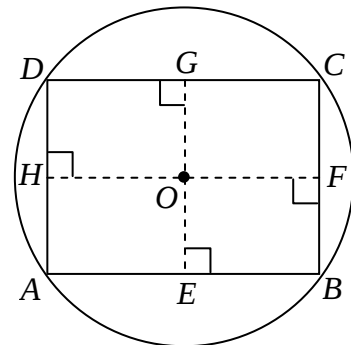
A. 4 cm.
 B. 5 cm.
 C. 8 cm.
 D. 12 cm.



NOT TO SCALE

26. A circle with centre O is shown below. If $m\overline{OE} = m\overline{OG}$ and $m\overline{OF} = m\overline{OH}$, which of the following is FALSE?

A. $\overline{AB}$ is congruent to $\overline{DC}$
 B. $\overline{AB}$ is congruent to $\overline{AD}$
 C. $\overline{BC}$ is congruent to $\overline{AD}$
 D. $\overline{BD}$ is congruent to $\overline{AC}$



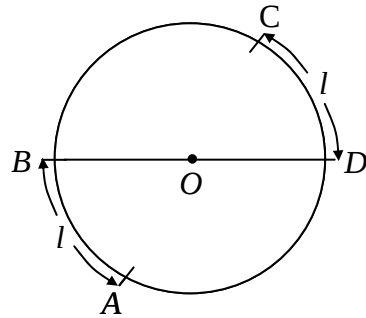
NOT TO SCALE

27. How many circles may pass through three non-collinear points?

A. One
 B. Two
 C. Three
 D. Infinite

28. In the given circle with centre O , arc $AB = \text{arc } CD = l$. Which of the following is FALSE?

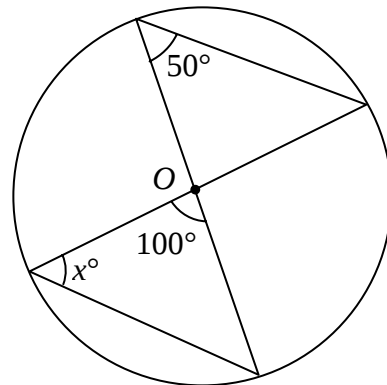
- A. $m\angle BOA = m\angle COD$
- B. $m\angle BOC = m\angle AOD$
- C. arc $AD = \text{arc } BC$
- D. arc $BC = \text{arc } CD$



NOT TO SCALE

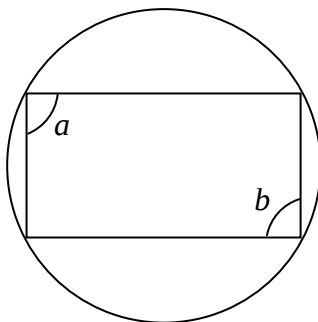
29. In the given circle with centre O , the value of x is

- A. 30°
- B. 40°
- C. 50°
- D. 80°

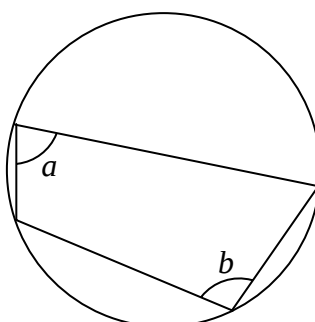


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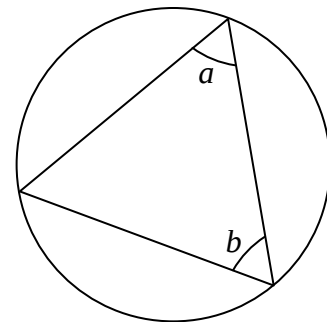
30. In which of the given figures $a + b = 180^\circ$?



I



II



III

NOT TO SCALE

- A. II only
- B. III only
- C. I and II
- D. I and III

END OF PAPER

Please use this page for rough work

Please use this page for rough work