# EXAM-STYLE CLASS TEST

| MARKS | DURATION | QUESTIONS |
|---|---|---|
| 23 | 35 minutes | 2 |

Name: _____ Class: _____

Date: _____

MARK ____ / 23

## INSTRUCTIONS AND INFORMATION

1. Answer **ALL** the questions in this question paper.
2. Answer QUESTION 1 by **circling** the letter (A–D) in the answer grid at the end of that section.
3. Show **ALL** calculations clearly.
4. Show all units where applicable.
5. Number the answers correctly according to the numbering system used in this question paper.
6. A non-programmable calculator may be used, unless stated otherwise.
7. Write neatly and legibly.

## QUESTION 1 [10 MARKS]

Four options are given as possible answers to the following questions. Choose the correct answer and circle the letter (A–D) in the grid at the end of this section. If you want to change your choice, put a cross through the wrong letter and circle your new choice.

**1.1** In a three-dimensional problem, the usual first step is to ... (1)

**A)** work only in the vertical triangle
**B)** assume every triangle is right-angled
**C)** use the area rule immediately
**D)** find a triangle lying in a single plane and solve that one first

**1.2** A vertical pole PQ stands at Q on level ground. From R on the ground the angle of elevation of P is $32°$, and QR $= 40$ m. The pole is ... tall. (1)

**A)** 47,17 m
**B)** 64,01 m
**C)** 24,99 m
**D)** 21,20 m

**1.3** A vertical pole PQ stands at Q on level ground, with R another point on the ground. The angle of ELEVATION of P from R is ... (1)

**A)** $P\hat{R}Q$
**B)** the angle between PQ and the vertical
**C)** $P\hat{Q}R$
**D)** $Q\hat{P}R$

**1.4** In $\triangle ABC$, AB $= 12$, $\hat{A} = 50°$ and $\hat{B} = 70°$. Then BC = ... (1)

**A)** 13,02
**B)** 10,61
**C)** 9,19
**D)** 13,57

**1.5** To find the DISTANCE between the feet of two vertical poles, you solve ... (1)

**A)** Pythagoras in a vertical plane
**B)** the horizontal triangle joining the two bases
**C)** either vertical triangle on its own
**D)** the area rule

**1.6** The COSINE rule is needed in a 3D problem when ... (1)

**A)** two angles and a side are known
**B)** the triangle is right-angled
**C)** two sides and the angle between them are known
**D)** only the angles are known

**1.7** Two vertical poles of EQUAL height stand at A and B. From a point P on the ground the angles of elevation of both tops are equal. This means ... (1)

**A)** PA = PB
**B)** AB equals the poles' height
**C)** PA equals the poles' height
**D)** the poles lean towards each other

**1.8** From a point A on level ground, 30 m from the base of a tower, the angle of elevation of the top is 55°. The tower is ... tall. (1)

**A)** 24,57 m
**B)** 52,30 m
**C)** 21,01 m
**D)** 42,84 m

**1.9** The angle between a line and a horizontal PLANE is the angle between that line and ... (1)

**A)** any line lying in the plane
**B)** the vertical
**C)** the normal to the plane
**D)** its projection onto the plane

**1.10** Why is the SINE rule used more often than SOH-CAH-TOA in 3D problems? (1)

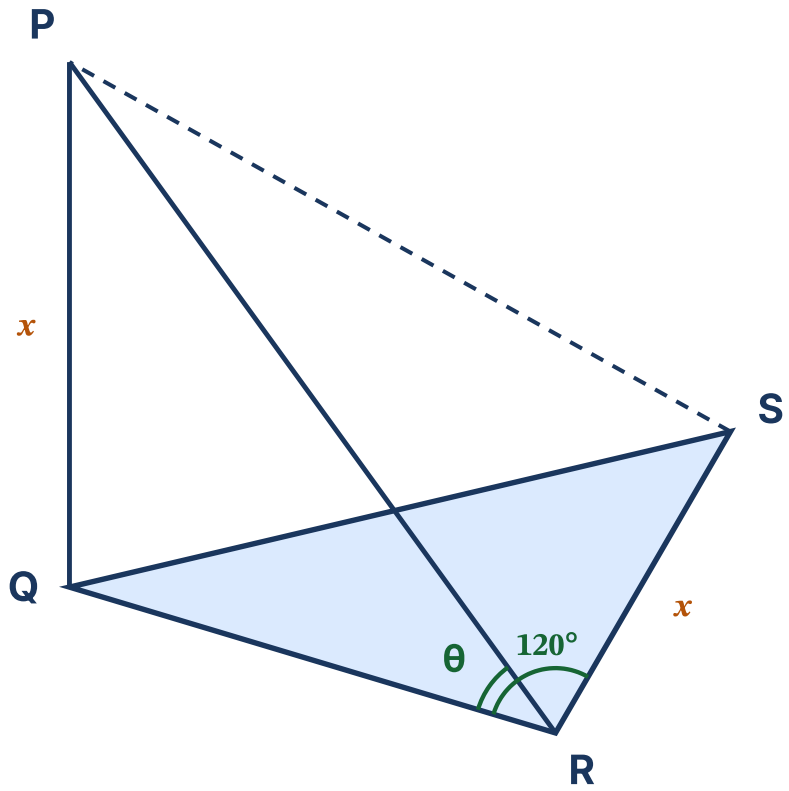
**A)** the triangles involved are usually not right-angled
**B)** the sine rule needs no angles at all
**C)** the sine rule is quicker to write out
**D)** SOH-CAH-TOA does not work in three dimensions

**ANSWER GRID — CIRCLE YOUR ANSWERS FOR QUESTION 1**

| | | | | |
|---|---|---|---|---|
| **1.1** | A | B | C | D |
| **1.2** | A | B | C | D |
| **1.3** | A | B | C | D |
| **1.4** | A | B | C | D |
| **1.5** | A | B | C | D |
| **1.6** | A | B | C | D |
| **1.7** | A | B | C | D |
| **1.8** | A | B | C | D |
| **1.9** | A | B | C | D |
| **1.10** | A | B | C | D |

**QUESTION 2** **[13 MARKS]**

In the diagram, PQ is a vertical tower. Q, R and S are points in the same horizontal plane. The angle of elevation from R to P is $\theta$, $Q\hat{R}S = 120°$ and PQ = RS = $x$.




ot drawn to scale — PQ is vertical and Q, R and S lie in one horizontal plan

**2.1** Determine QR in terms of $\theta$ and $x$. **(3)**

**2.2** Explain which rule must be used to find QS, and why. **(2)**

**2.3** If $x = 15$ cm and $\theta = 22°$, calculate the length of QS, correct to TWO decimal places. **(5)**

**2.4** Hence calculate the size of $Q\hat{P}S$, correct to TWO decimal places. **(3)**

**TOTAL: 23 marks**

*This question paper consists of 2 questions.*

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