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GRADE 10 · TRIGONOMETRY

Trigonometry: Solving Triangles & Angles of Elevation

EXAM-STYLE CLASS TEST

MARKS	DURATION	QUESTIONS
30	45 minutes	3

Name: ..... Class: .....

Date: .....

MARK ____ / 30

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 An angle of elevation is measured ... (1)

A) from the horizontal UP to the line of sight
B) from the line of sight up to the vertical
C) from the vertical down to the line of sight
D) between the two objects

1.2 A tower is 45 m tall. From a point 60 m away on level ground, the angle of elevation of its top is ... (1)

A) 36,87°
B) 53,13°
C) 0,64°
D) 48,59°

1.3 From the top of a cliff 80 m high the angle of depression of a boat is 25°. The boat is ... from the foot of the cliff. (1)

A) 37,30 m
B) 189,30 m
C) 72,50 m
D) 171,56 m

1.4 In $\triangle ABC$, $\hat{B} = 90°$, $AC = 26$ and $BC = 10$. Then $AB = ...$ (1)

A) 36
B) 16
C) 27,86
D) 24

1.5 A ramp rises 1,5 m over a horizontal distance of 8 m. Its angle of inclination is ... (1)

A) 79,38°
B) 10,81°
C) 10,62°
D) 0,19°

1.6 In $\triangle PQR$, $\hat{Q} = 90°$, $\hat{P} = 32°$ and $PR = 15$ cm. Then QR = ... (1)

A) 12,72 cm **B)** 7,95 cm

C) 28,31 cm **D)** 9,37 cm

1.7 Two buildings stand 30 m apart. From the top of the shorter one the angle of elevation of the top of the taller one is $40°$. The taller building is higher by ... (1)

A) 25,17 m **B)** 19,28 m

C) 39,16 m **D)** 35,75 m

1.8 Which ratio finds an ANGLE when the opposite side and the hypotenuse are known? (1)

A) sin **B)** $\sin^{-1}$

C) $\cos^{-1}$ **D)** $\tan^{-1}$

1.9 A kite string 50 m long makes an angle of $58°$ with the ground. The kite is ... above the ground. (1)

A) 58,96 m **B)** 42,40 m

C) 26,50 m **D)** 80,02 m

1.10 In $\triangle ABC$, $\hat{B} = 90°$. Then $\hat{A} = 90° - \hat{C}$ because ... (1)

A) the two acute angles are always equal **B)** $\hat{B}$ is the largest angle

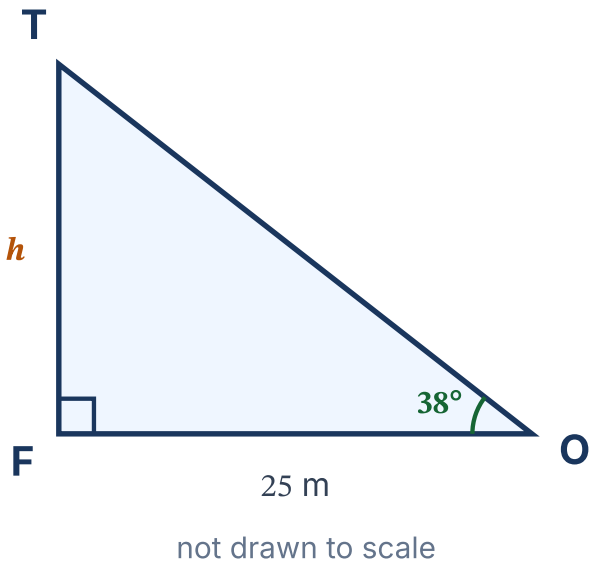
C) the three angles of a triangle add up to $180°$ **D)** the sides are always in the ratio $3 : 4 : 5$

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 **[10 MARKS]**

In the diagram below, a vertical tower stands on level ground. From a point 25 m from the foot of the tower, the angle of elevation to the top of the tower is $38°$. The height of the tower is h.



not drawn to scale

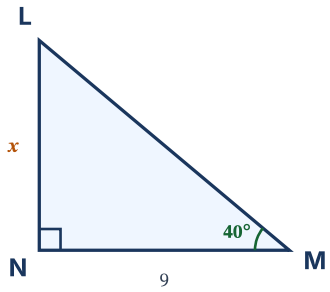
2.1 Write down which trigonometric ratio relates the 25 m, the $38°$ and the height h, and give a reason for your choice. **(2)**

2.2 Calculate the height of the tower, correct to TWO decimal places. **(4)**

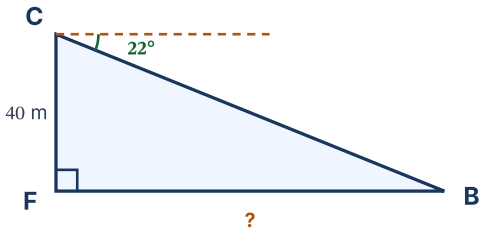
2.3 The observer now moves to a point where the angle of elevation is $50°$. Determine, with a calculation, whether the observer is closer to or further from the tower. **(4)**

QUESTION 3 [10 MARKS]

Answer the questions below. Round off to TWO decimal places where necessary.



(a)



(b) the dashed line is horizontal

3.1 In a right-angled triangle the side opposite a $40°$ angle is x and the adjacent side is 9. Calculate x. **(3)**

3.2 The angle of DEPRESSION from the top of a 40 m cliff to a boat is $22°$. Calculate how far the boat is from the foot of the cliff. **(4)**

3.3 Explain the difference between an angle of elevation and an angle of depression, and why they are equal in the question above. **(3)**

TOTAL: 30 marks

This question paper consists of 3 questions.

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