**10C Unit 2: Trigonometry Practice Booklet**

**2.1 Trigonometric Ratios**

1. Consider the three triangles below. For each triangle, complete the table for the angle xo.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Triangle | Opposite Side | Adjacent Side | Hypotenuse | Sine Ratio | Cosine Ratio | Tangent Ratio |
| A) |  |  |  |  |  |  |
| B) |  |  |  |  |  |  |
| C)  |  |  |  |  |  |  |

 A) B) C)



1. Determine, as a fraction in simplest form, the values of the three trigonometric ratios.
2. Sin c = B) Sin c =

Cos c = Cos c =

Tan c = Tan c =

1. In each case, write the rational number which represents the trigonometric ratio.

A) Sin A = B) cos B = C) tan X =

1. In right triangle *ABC*, *AB* = 52 units, *AC* = 48 units and *BC* = 20 units. The value of cos *B* and sin *B* are respectively
2. $\frac{5}{13}$ and $\frac{12}{13}$
3. $\frac{12}{13}$ and $\frac{5}{13}$
4. $\frac{5}{12}$ and $\frac{12}{5}$
5. $\frac{5}{13}$ and $\frac{12}{5}$
6. For the right angled triangle *ABC*, only one of the following ratios is correct. The correct ratio is
7. $\sin(A= \frac{8}{15})$
8. $\cos(A= \frac{8}{17})$
9. $\tan(B= \frac{8}{15})$
10. $\sin(B= \frac{15}{17})$
11. In a right triangle $\tan(x°)= \frac{7}{5}$. A student claims this indicated that in the right triangle the side opposite to the angle $x°=7$ and the side adjacent to the angle $x°=5.$ The student’s claim
12. is always true
13. is always false
14. may be true or false
15. depends on the value of $x°$

**2.2 Calculating the Side Length in a Right Triangle**

1. Calculate, to the nearest tenth, the length of the indicated side in each triangle.

1. B) C)



2. The kite string is 65 metres long and makes an angle of 32o with the ground. Calculate, to the nearest metre, the vertical height, *h*, of the middle of the kite above the ground.



3. Use the measurements in the diagram to determine the height of the flagpole to the nearest tenth of a metre.



4. Calculate, to the nearest tenth, the length of the indicated side in each triangle.

 A) B) C)

5. Explain why trigonometric ratios could not be used to calculate the side marked *x* in each of the following triangles.

 A) B) C)

6. Triangle *DEF* is right angled at *F*. Angle *DEF* = 36o and *DF* = 15 cm. The length of *DE*, in cm, is given by

1. $15sin 36°$
2. $\frac{15}{\cos(36°)}$
3. $15\cos(54°)$
4. $\frac{15}{\cos(54°)}$



7. On a particular day, the Eiffel Tower in Paris casts a shadow of 599 m. Use the sketch to determine the height of the tower. To the nearest metre, the height of the tower is

**

 *Record your answer in the numerical response box.*

8. In right triangle *ABC,* angle *ABC*  = 90o angle *BAC* = 70oand *AC* = 29 units. To the nearest whole number, the perimeter of the triangle is \_\_\_\_\_\_\_.

**

*Record your answer in the numerical response box.*

**2.3 Calculating an Angle in a Right Angle Triangle**

1. In each case, calculate the measure of the indicated angle to the nearest degree.

 A) B) C)



2. Consider the diagram consisting of two right triangles with a common side *AD.*

 A) Find the length of AD

B) Determine, to the nearest degree, the measure of angle *BCA*.



3. In each case calculate the size of *<BAC* to the nearest degree.
 A) B)

4. The Leaning Tower of Pisa is a building in Italy which leans due to the instability

of the ground underneath it. At different points in history the tower has leaned at

different angles. Use the measurements in the sketch to determine the angle of lean

from the vertical to the nearest hundredth of a degree.

5. A set of stairs has a vertical rise of 15 cm for every 28 cm horizontal run. To the nearest degree, the angle between the stairs and the floor is

**A.** 28o

**B.** 32o
**C.** 62o

**D.** 64o

6. A tourist at the top of a lighthouse spots a boat in the water below. The angle of depression of the boast from the tourist is 35o. At the same moment in time, the angle of elevation of the tourist from the boat, to the nearest degree, is \_\_\_\_\_.

 *Record your answer in the numerical response box.*

7. A corner flag in a World Cup soccer match is 5 feet high. At game time, the flag casts a shadow which is 3.2 feet long. To the nearest 0.1 degree, the angle of elevation of the sun is \_\_\_\_\_.



 *Record your answer in the numerical response box.*

8. A submarine goes into a dive at a certain angle of depression and travels 275 m while making its dive. When the submarine stops its dive it has dropped a vertical distance of 150 m. To the nearest tenth of a degree, the angle of depression of the dive is \_\_\_\_\_.

*Record your answer in the numerical response box.*

**2.4 Application of Trigonometry**

1. Solve triangle *ABC* giving each measure correct to the nearest whole number.
2. Solve triangle *DEF* in which angle *DEF* = 90o, angle *EDF* = 50o and DF = 173 mm. Give all answers to the nearest whole number.
3. A boat is 300 m away from the foot of a cliff. The angle of elevation from the boat to the top of the cliff is 16o.

A) Show this information on a diagram and determine the height of the cliff to the nearest metre.

B) If the boat sails 75 m closer to the cliff, determine, to the nearest degree, the new angle of elevation of the cliff top from the boat.

1. Two trees in a park are 14.80 metres apart. An observer, whose eyeline is 1.80 m above the ground, is standing halfway between the trees. The angles of elevation of the tops of the trees from the observers eyeline are 17o and 23o.
a) Show the information on the diagram.
b) Determine the height of each tree to the
nearest 0.01 m.
2. A totem pole is placed in a 2 metre deep hole in the ground. Two ropes attached to the top of the pole are used to pull the totem pole upright. The ropes are anchored into the ground on opposite sides of the pole.

Each rope is 19 m long and is anchored into the ground 12 m horizontally from the centre of the totem pole.

1. Complete the sketch to illustrate this situation.
2. Calculate to the nearest tenth of a degree, the angle of

elevation of the top of the totem pole from the point
where the tope is anchored into the ground.

1. Determine, to the nearest 0.1 m, the length of the totem pole before it was placed in the ground.



1. Determine the length of *PQ*, to the nearest 0.1 cm.
A) B)



1. Determine the measure of angle *ABC*, to the nearest degree.
2. B)

**Trigonometry Practice Test**

*Use the following information to answer the first three questions.*

1. The value of $\cos(F)$ is
2. $\frac{8}{15}$
3. $\frac{8}{17}$
4. $\frac{17}{8}$
5. 62
6. The value of *x* is
7. $\frac{15}{17}$
8. $\frac{8}{17}$
9. 28
10. 62
11. Which statement is false?
12. $\cos(E=\sin(F))$
13. $\sin(E=\cos(F))$
14. $\tan(E=\tan(F))$
15. $\tan(F=\frac{\sin(F)}{\cos(F)})$
16. The value of *a* is
17. $14 tan 51°$
18. $\frac{14}{\tan(51°)}$
19. $14 cos 51°$
20. $\frac{14}{\cos(51°)}$
21. The value of *x*, to the nearest tenth of a degree, is
22. $35.0°$
23. $61.9°$
24. $72.3°$
25. $29.3°$
26. A guy wire attached to a pole makes an angle of 71.4o with the level ground. It is 13.8 feet from the pole at ground level. How far above the ground is the guy wire attached to the pole?
27. 4.6 feet
28. 13.1 feet
29. 14.6 feet
30. 41.0 feet
31. The value of length *AC*, to the nearest tenth, is
32. 0.1
33. 2.1
34. 7.2
35. 7.5
36. A man, six feet tall, casts a shadow of 10.6 feet. The angle of elevation of the sun is
37. 30o
38. 34o
39. 56o
40. 60o



*Use the following information to answer the next three questions.*

The diagram shows how a horse breeder has used fencing to divide a parcel of land into two triangular paddocks for his horses. Each of the line segments represents fencing.

1. The length of the fencing represented by *DF* is
2. 0.89 km
3. 0.79 km
4. 0.62 km
5. 0.58 km
6. The value of *cos* G is
7. 0.68
8. 0.72
9. 0.80
10. Impossible to determine from the given information



1. The total area of the two triangular paddocks, to the nearest 0.1 km2, is \_\_\_\_\_\_\_.

*Record your answer in the numerical response box.*

1. The length of *AC*, to the nearest metre, is
2. 54 m
3. 70 m
4. 87 m
5. 103 m
6. Determine the area of the following triangle to the nearest square centimetre.



*Record your answer in the numerical response box.*

1. $∆ABC $is isosceles with *AB = CB*. The area of the triangle is 30 cm2 and *AC* = 12 cm. The measure of *<ABC*, to the nearest degree, is
2. 100o
3. 50o
4. 45o
5. 23o

*Use the following diagram to answer the next two questions.*

1. The length of *LP*, to the nearest centimetre, is
2. 51 cm
3. 54 cm
4. 74 cm
5. 76 cm
6. The length of *MN*, to the nearest centimetre, is *Record your answer in the numerical response box.*

**Answer Key**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Triangle | Opposite Side | Adjacent Side | Hypotenuse | Sine Ratio | Cosine Ratio | Tangent Ratio |
| A) | PR | RQ | PQ | $$\frac{PR}{PQ}$$ | $$\frac{RQ}{PQ}$$ | $$\frac{PR}{RQ}$$ |
| B) | LM | LN | MN | $$\frac{ML}{MN}$$ | $$\frac{LN}{MN}$$ | $$\frac{ML}{LN}$$ |
| C)  | BC | AC | AB | $$\frac{BC}{AB}$$ | $$\frac{AC}{AB}$$ | $$\frac{BC}{AC}$$ |

**2.1:**

1.

2. A) $\sin(c= \frac{3}{5})$ $\cos(c= \frac{4}{5})$ $\tan(c= \frac{3}{4})$ B) $\sin(c= \frac{3}{5})$ $\cos(c= \frac{4}{5})$ $\tan(c= \frac{3}{4})$

3. A) $\sin(A= \frac{5}{13})$ B) $\cos(B= \frac{4}{5})$ C) $\tan(x= 1)$ 4. A 5. D 6. C

**2.2:**

1. A) a = 10.5 B) e = 2.7 C) c = 4.4 2. 34 m 3. 11.1 m

4. A) 10.5 mm B) 1.1 C) 6.5 in
5.A) No side length given b) The triangle does not have a right angle. C) No angle given.

6. D 7. 324 8. 66

**2.3:**1. A) 13o B) 37o C) x = 41o y = 49o

2. A) AD = 56 B) 33o 3. A) 67o B) 100o
4. 5.23o 5. A 6. 35 7. 57.4 8. 33.1

**2.4:**

1. <ABC = 37o <BAC = 53o <ACB = 90o AB = 48 AC = 29 BC = 38

2. <DEF = 90o <EDF = 50o <DFE = 40o DF = 173 mm DE = 111 mm EF = 133 mm

3. A) 86 m B) 21o 4. B) 4.06 m and 4.94 m
5. B) 50.8o C) 16.7 m 6.A) 2.1 cm B) 17.9 cm 7. A) 43o B) 54o

**Practice Test:**1. B 2. C 3. C 4. A 5. B 6. D

7. D 8. A 9. A 10. A 11. 0.5 12. B

13. 362 14. A 15. B 16. 38