REG-TTC-2324-ASM-SET 3-MATH
Suggested solutions

Multiple Choice Questions

1. B	2. D	3. D	4. D	5. C
6. D	7. D	8. A	9. B	10. B
11. C	12. C	13. D	14. A	15. D
16. A	17. B	18. C	19. C	20. C
21. A	22. D	23. D	24. B	25. A
26. C	27. D	28. A	29. B	30. C

1. B

$\angle BCD = \angle EBD = 70°$
$\angle CDB = \angle EBD = 70°$
$\angle CBD = 180° - 70° - 70° = 40°$

2. D

$\angle EDB = \angle EBA = 50°$
$\angle EBD = \angle BDC = 60°$
$\angle BED = 180° - 50° - 60° = 70°$

3. D

$\angle BCE = \angle CEG = 70°$
$\angle CBE = \angle CEG = 70°$
$\angle BEC = 180° - 70° - 70° = 40°$
$\angle ABE = \angle BEC = 40°$
$\angle ADE = \angle ABE = 40°$

4. D

Let $\angle OBA = x$.
$\angle OAT = 90°$
$\angle TAB = 90° - x$
$\angle ACB = \angle TAB = 90° - x$
$\angle OCB = \angle ACB - 13° = 77° - x$

$$\angle TCA + \angle TAC + \angle ATC = 180°$$
$$[13° + (77° - x)] + [(90° - x) + (x + 13°)] + 40° = 180°$$
$$x = 53°$$

5. C

$\angle BAC = 90°$
$\angle ABC = 180° - 90° - 35° = 55°$
$\angle CAP = \angle ABC = 55°$

6. D

$\angle ADC = 180° - 74° = 106°$
Since $\overset{\frown}{AD} = \overset{\frown}{DC}$, we have $AD = DC$ and $\angle DCA = \dfrac{180° - 106°}{2} = 37°$.
$\angle ACB = \angle SAB = \angle ABC = 74°$
$\angle BCD = 74° + 37° = 111°$

7. D

$\angle CDB = \angle DAC = 34°$
$\angle DCB = \dfrac{180° - 34°}{2} = 73°$
$\angle BDA = 180° - 73° - 34° - 34° = 39°$

8. A

$\angle BEF = \angle FBC = 40°$
$\angle EBF = \angle EFG - \angle BEF = 95° - 40° = 55°$
$\angle DBE = \angle EBF = 55°$ $\angle ABD = 180° - 55° - 55° - 40° = 30°$

9. B

Let $\angle ABC = x$.
$\angle CAT = \angle ABC = x$
$\angle BAC = \angle ACB = \angle ATC + \angle CAT = x + 48°$
Consider $\triangle ABC$.

$$x + 2(x + 48°) = 180°$$
$$x = 28°$$

10. B

$\angle ADB = \angle TAB = 42°$
$\dfrac{\angle BDC}{\angle ADB} = \dfrac{\overset{\frown}{BC}}{\overset{\frown}{AB}}$
$\dfrac{\angle BDC}{42°} = \dfrac{2}{3}$
$\angle BDC = 28°$
$\angle ADC = 28° + 42° = 70°$

11. C

$\angle ADE = \angle CAE = 80°$
$\angle ADF = \angle AEF = 36°$
$\angle EDF = 80° - 36° = 44°$

12. C

$\angle DBA = \angle BED$

$\angle BED + (\angle DBA + 51°) + 37° = 180°$

$2\angle BED + 88° = 180°$

$\angle BED = 46°$

13. D

Draw line segments BD and AB.

$\angle CDB = \angle CBQ = 39°$

$\angle BDA = 79° - 39° = 40°$

$\angle ABD = \angle DAP = 42°$

$\angle DAB = 180° - 42° - 40° = 98°$

$\angle BCD = 180° - 98° = 82°$

14. A

$\angle DAC = 90°$

$\angle ACD = 180° - 90° - 48° = 42°$

$\angle DAT = \angle ACD = 42°$

15. D

$\angle QPS = 180° - 123° = 57°$

$\angle PQS = 180° - 57° - 48° = 75°$

$\angle APS = \angle PQS = 75°$

16. A

Let $\angle BAQ = x$. $\angle ADB = \angle BAQ = x$

$\angle PAB + \angle PBA = \angle BAQ = x$

$\angle APB = \angle ABP = \frac{x}{2}$

$\angle DAB = 180° - 57°$

$57° + x + \frac{x}{2} = 180°$

$x = 38°$

17. B

$\angle SPQ = 180° - 123° = 57°$

$\angle SQP = 180° - 57° - 48° = 75°$

$x = \angle SQP = 75°$

18. C

$PA = PB$
$\angle PAB = \frac{180° - 46°}{2} = 67°$
$\angle ACB = \angle PAB = 67°$
$\angle ABC = 180° - 67° - 28° = 85°$
$\angle ADC = 180° - 85° = 95°$

19. C

$AB = AD$
$\angle ADB = \frac{180° - 80°}{2} = 50°$
$\angle BCD = \angle ADB = 50°$
$\angle DBC = 180° - 50° - 45° = 85°$

20. C

$EC = EA$
$\angle ECA = \angle EAC = 36°$
$FA = FD$
$\angle FDA = \angle DAF = 28°$
$\angle ADC = \angle EAC = 36°$
$\angle ACD = \angle FAD = 28°$
$\angle CBD = 180° - (36° + 28°) - (36° + 28°) = 52°$

21. A

$\angle ABT = \angle ACB = 68°$
$TA = TB$
$\angle BAT = \angle ABT = 68°$
$\angle ATB = 180° - 68° - 68° = 44°$

22. D

$EB = EC$
$\angle EBC = \frac{180° - 72°}{2} = 54°$
$\angle BAC = \angle EBC = 54°$
$\angle ACF = \angle ABC = 63°$
$AB = AC$
$\angle ABC = \frac{180° - 54°}{2} = 63°$
$\angle DBE = 90°$
$\angle CBD = 90° - 54° = 36°$
$\angle CAF = \angle CBD = 36°$
$\angle AFC = 180° - 36° - 63° = 81°$

23. D

$TA = TB$

$\angle BAT = \angle ABT = \angle ACB = x$

Consider $\triangle ABT$.

$$x + x + y = 180°$$

$$2x + y = 180°$$

24. B

$$\angle BCA = \angle BAC = \frac{180° - 30°}{2} = 75°$$

$\angle CDE = \angle ACB = 75°$

$\angle DCE = 180° - 2 \times 75° = 30°$

$\angle ECA = 180° - 75° - 30° = 75°$

$\angle EFA = 180° - 75° = 105°$

25. A

$\angle ABG = \angle BEG = 75°$

$\angle CBG = 180° - 75° = 105°$

26. C

$\angle DAC = \angle ABC$

$\triangle ABC \sim \triangle DAC$

$$\frac{AC}{CD} = \frac{BC}{AC}$$

$$\frac{AC}{6} = \frac{18 + 6}{AC}$$

$$AC^2 = 144$$

$AC = 12$ or -12 (rejected)

27. D

Let O be the centre of the circle.

Let E be the mid-point of BC such that $OE \perp BC$.

$\angle OAD = 90°$

$\angle OAC = 90° - 65° = 25°$

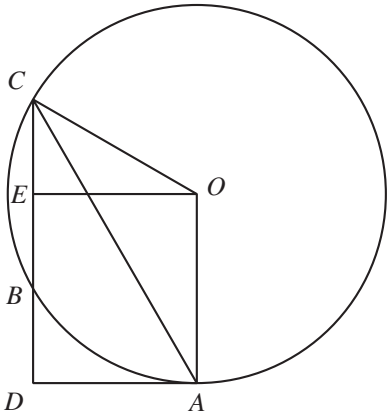
$\angle AOC = 180° - 25° - 25° = 130°$

$\angle COE = 130° - 90° = 40°$

$CE = \frac{BC}{2} = 4\,\text{cm}$

$$\text{Radius} = \frac{4}{\sin 40°}$$

$$\approx 6.2\,\text{cm}$$



28. A

$\angle ABE = \angle QAE = x$

$\angle EDC = \angle ABE$

$y = x$

29. B

$\angle APB = 90°$

$\angle APB = \angle ABP = 68°$

$\angle OPA = 90° - 68° = 22°$

$\angle BOP = 180° - 68° - 68° = 44°$

$\angle ORP = \angle BOP = 44°$

$\angle POR = 180° - 44° - 22° = 114°$

$\angle RQP = 180° - 114° = 66°$

30. C

$OP = OB$

$\angle OBP = \angle BPQ = 12°$

$\angle BOQ = 2\angle BPQ = 24°$

$\angle OCB = \angle BOQ = 24°$

$\angle BOC = 180° - 24° - 12° = 144°$

$\angle BAC = 180° - 144° = 36°$

END OF PAPER