

## Topic 22 Circle theorems (Pre-TT) [33] MARKSCHEME

- 1.
- |     |      |                                                                                                                                                                     |      |
|-----|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| (a) | (i)  | 40                                                                                                                                                                  | B1   |
|     | (ii) | 140 <u>or</u> 180 – (their $x$ )<br><i>Do not ft if answer = 140 in (a)(i)</i>                                                                                      | B1ft |
| (b) |      | Logical and precise explanation<br>(either written or as calculation)<br><i>B1 for 1 angle labelled or stated correctly, no reason</i>                              | B2   |
| (c) |      | $24 \div 8 \times 2$<br><i>or <math>OP = 6</math></i>                                                                                                               | M1   |
|     |      | $\pi$ (or 3.14) $\times$ (their 6) <sup>2</sup>                                                                                                                     | M1   |
|     |      | $36\pi$ or $36 \times \pi$ or $\pi \times 36$<br><i>allow <math>\pi 36</math></i><br><i>SC2 108 to 114 or <math>\pi \times 9</math> oe</i><br><i>SC1 27 to 28.5</i> | A1   |
- [7]
- 2.
- |     |                               |                                                                 |    |
|-----|-------------------------------|-----------------------------------------------------------------|----|
| (a) | 52°                           |                                                                 | B1 |
| (b) | 52 at Q                       | <i>or angle NPQ = 70</i><br><i>may be credited from diagram</i> | M1 |
|     | (angles in) alternate segment |                                                                 | B1 |
|     | 58                            | <i>58 as answer scores M1A1</i>                                 | A1 |
- [4]
- 3.
- |     |                                                                                                                               |                               |    |
|-----|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------|----|
| (a) | Cyclic (quadrilateral)                                                                                                        |                               | B1 |
| (b) | $\angle BCE = 78^\circ$ or $\angle C = 78^\circ$                                                                              | <i>May be seen on diagram</i> | B1 |
|     | $\angle BCD = 102^\circ$                                                                                                      | <i>May be seen on diagram</i> | B1 |
|     | $(x =) 78$                                                                                                                    |                               | B1 |
|     | <i>Alternatives to be marked as follows</i>                                                                                   |                               |    |
|     | <i>Use of cyclic quad properties <math>\rightarrow</math> finding a correct angle</i><br><i>eg <math>\angle D = 67</math></i> |                               | B1 |
|     | <i>Finding third angle in a triangle</i><br><i>eg <math>\triangle ADE</math></i>                                              |                               | B1 |
|     | <i>Correct answer</i>                                                                                                         |                               | B1 |
- [4]

- 4.
- (a) 65 B1
- (b) 25 B1
- [2]

- 5.
- (a)  $180 - 90 - 72$  M1  
           oe
- 18 A1
- (b) (i) 63 B1
- (ii) 117 B1
- or 180 - their 63 correctly evaluated*  
           *(do not allow 90)*
- (c) 52 at Q M1
- or angle NPQ = 70*  
           *may be credited from diagram*
- (angles in) alternate segment B1
- 58 A1
- 58 as answer scores M1A1*
- [7]

6.

angle BCA = angle CAE alternate angles	1 1
angle CBA = angle CAE alternate segment theorem	1 1
angle BCA = angle CBA therefore isosceles	1 3 A02.4b 1 A03.1a 1 A03.3

7.

30	4 1 A02.1a 2 A03.1b 1 A03.2	M1 for $360 - 5x = 2(2x + 45)$ oe M1 for correct rearrangement of <i>their</i> equation to $ax + b = c$ M1 for solution from <i>their</i> $ax + b = c$
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