Geometry: 2D Shapes & Angles: Hard Practice Paper 4 Answers

Q#	Answer	Explanation
1	C	The angles lie on a straight line, so $4x + (x + 20°) + 40° = 180°$. Collecting terms gives $5x + 60° = 180°$, so $5x = 120°$ and $x = 24°$.
2	B	The triangle is isosceles, so the two base angles are equal and both are called $2x$. The angles add up to 180°, so $2x + 2x + x = 180°$. That gives $5x = 180°$ and $x = 36°$.
3	A	The exterior angles of any polygon add up to 360°, so the number of sides is $360° \div 40° = 9$.
4	D	Angles around a point add up to 360°, so $3x + 3x + 2x + 4x = 360°$. That gives $12x = 360°$ and $x = 30°$. The largest angle is $4x = 4 \times 30° = 120°$.
5	B	Both marked angles lie outside the parallel lines and on opposite sides of the slanted line, so they are alternate angles and therefore equal: $3x + 15° = 5x - 25°$. Adding 25° and taking $3x$ from both sides gives $40° = 2x$, so $x = 20°$.
6	C	Adding them gives $3x + 60° = 180°$, so $3x = 120°$ and $x = 40°$. The largest angle is $x + 40° = 40° + 40° = 80°$.
7	E	Each exterior angle is $360° \div 15 = 24°$. The interior angle sits next to it on a straight line, so it is $180° - 24° = 156°$.
8	A	Using $(n - 2) \times 180° = 1260°$, divide both sides by 180° to get $n - 2 = 7$, so $n = 9$.
9	D	The minute hand is at 8, which is 240° from the 12. The hour hand is two thirds of the way past 1, at $1 \times 30° + 20° = 50°$. The gap is $240° - 50° = 190°$, so the angle between the hands (the shorter way round) is $360° - 190° = 170°$.
10	E	The ratio has $4 + 5 + 9 = 18$ parts sharing 180°, so one part is 10°. The largest angle is 9 parts: $9 \times 10° = 90°$.
11	C	The two marked angles lie on a straight line, so $(x + 25°) + (2x + 20°) = 180°$. Collecting terms gives $3x + 45° = 180°$, so $3x = 135°$ and $x = 45°$.

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12	B	A regular polygon has one line of symmetry for each side. An octagon has 8 sides, so it has 8 lines of symmetry.
13	D	A full turn is 360°, so the reflex angle is 360° − 132° = 228°.
14	C	The angles of a quadrilateral add up to 360°, so x + 2x + x + 2x = 360°. That gives 6x = 360°, so x = 60°.
15	E	The exterior angle would be 180° − 120° = 60°, and 360° ÷ 60° = 6 sides. A 6-sided regular polygon is a hexagon.

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