ANGLES IN PARALLEL LINES

Pearson Edexcel - Tuesday 19 May 2020 - Paper 1 (Non-Calculator) Foundation Tier

1.

25	85 with working and reasons	M1	for correct use of corresponding angles eg AEB = 63 or co-interior angles eg BCD = 180 − 148 (= 32) or DEB = 180 − 63 (= 117)	Angles must be clearly labelled on the diagram or otherwise identified. Full solution must be seen.
		M1	(dep) for a complete method to find angle EAB eg. 180 − "63" − (180 − 148) or 148 − "63" or "117" − (180 − 148)	Correct method can be implied from angles on the diagram if no ambiguity or contradiction.
		A1	for EAB = 85 (identified)	
		C2	(dep on M2) all working correct with all appropriate reasons stated. Corresponding angles are equal Allied angles / Co-interior angles add up to 180 Angles on a straight line add up to 180 Angles in a triangle add up to 180 The exterior angle of a triangle is equal to the sum of the interior opposite angles.	When reasons are given the key words underlined must be present. Reasons need to be linked to their method; any reasons not linked, do not credit. There should be no incorrect reasons given.
		(C1	for one reason relating to parallel lines clearly used and stated or for any two reasons clearly stated for their fully correct method)	

Pearson Edexcel - Thursday 8 November 2018 - Paper 2 (Calculator) Foundation Tier

2.

22	60	M1	use of parallel lines to find an angle eg ABE=70 or EBG=75 or EBC = 110 or shows parts of x as 35 or 25	Parts of x should be identified on the diagram by the insertion of a dividing line through angle x (need not be identified or drawn parallel).
		M1	for a complete method to find angle x; could be in working or on the diagram	Correct method can be implied from angles on the diagram if no ambiguity or contradiction.
		A1	for x = 60	
		C1	(dep on M1) for one reason linked to parallel lines and one other reason, supported by working taken from: alternate angles are equal, allied angles / co-interior angles add up to 180, angles on a straight line add up to 180, angles in a triangle add up to 180°	Underlined words need to be shown; reasons need to be linked to their method; any reasons not linked do not credit. There should be no incorrect reasons given.

Pearson Edexcel - Thursday 2 November 2017 - Paper 1 (Non-Calculator) Foundation Tier

3.

25	CB extended to form CG	Reasoning	B1	for 35 or 75 or 145 or 105 or DEF = 70, marked on the diagram or 3 letter description
			M1	for 180−70−35 or 180−75−35 or a correct pair of angles that would lead to 75 or 70, eg AFB = 35 and FAB = 75 or AFB = 35 and ABG = 75 or FBC = 35 and ABG = 75 or EDF = 75 and DEF = 70 or FDC = 105 and FBC = 35 or ABC = 105 and FBC = 35
			C2	(dep on B1M1) All figures correct with all appropriate reasons stated. Angles must be clearly labelled or on the diagram. Full solution must be seen
			(C1	(dep on B1 or M1) for one reason clearly used and stated.) Corresponding angles are equal, alternate angles are equal, opposite angles in a parallelogram are equal, angles in a triangle sum to 180, angles on a straight line sum to 180, vertically opposite angles are equal, vertically opposite angles are equal, angles in a quadrilateral sum to 360, co-interior angles sum to 180, allied angles sum to 180, angles around a point sum to 360

Pearson Edexcel – Specimen 2 - Paper 1 (Non-Calculator) Foundation Tier

4.

16		No with reason	M1	Starting reasoning 120 + 57 (= 177)
			A1	Comparison of 177 with 180
			C1	Completes correct reasoning with reference to eg co-interior (or allied) angles total 180

OCR Thursday 6 June 2019 – Morning (Non-Calculator) Foundation Tier

5.

7		alternate	1		Condone alternating, alternative Do not accept Alternate = 180
		corresponding	1		Condone correspondent Do not accept Corresponding = 180
					Accept other fully-reasoned methods

AQA Tuesday 13 June 2017 Morning– Morning (Calculator) Foundation Tier

6.

24(a)	$2x + 10 = 3x - 20$	M1	oe $180 - (2x + 10) + 3x - 20 = 180$
	$3x - 2x = 20 + 10$ or $x = 30$	M1dep	oe
	$2 \times$ their $30 + 10$ or $3 \times$ their $30 - 20$ or 70	M1dep	oe
	110	A1	

<div align="center">Additional Guidance</div>

$x = 30$, $y = 180 - 3(30) + 20 = 110$	M1M1M1A1
$x = 30$, $y = 180 - 3(30) - 20 = 110$ recovered missing bracket	M1M1M1A1
$x = 30$, $y = 180 - 3(30) - 20 = 70$ not recovered	M1M1M0A0
$2x + 10 = 3x - 20$ $3x - 2x = 20 + 10$ $x = 10$ $2 \times 10 + 10 (= 30)$	M1M1M1A0
$2x + 10 = 3x - 20$ $x = 10$ $2 \times 10 + 10 (= 30)$	M1M0M0A0
$y + 2x + 10 = 3x - 20 + y$	M1M0M0A0
$w = 3x - 20$ seen or on diagram	M0M0M0A0
$w = 2x + 10$ seen or on diagram	M0M0M0A0

24(b)	$2x + 10 = 60$ or $2x = 60 - 10$ or $2x = 50$ or $x = 25$	M1		
	$3 \times$ their $25 - 20$ or 55 or $180 - 55$ or 125	M1dep	oe	
	$(y =) 125$ and bigger or $(y$ is$)$ 15 bigger	A1ft	oe ft their (a)	

Additional Guidance	
Note: A complete logical explanation of the effect of lines not being parallel eg w is smaller so $2x + 10$ is smaller so x is smaller so $3x - 20$ is smaller so y is bigger	M1M1A1
$2 \times 25 + 10 = 60$	M1M0A0
y is bigger ticked but no valid working	M0M0A0

7.

<table>
<tr><td rowspan="11">29</td><td colspan="4">Alternative method 1</td></tr>
<tr>
<td>$\angle PCB = 180 - 90 - 15$ or $75°$
or
$\angle PCB = 90 - 15$</td>
<td>M1</td>
<td>oe
Angle may be seen on diagram</td>
</tr>
<tr>
<td>$\angle ABC = \angle PCB =$ their 75
and
$\angle BCD = 180 -$ their 75 or $105°$</td>
<td>M1</td>
<td>oe
Angle may be seen on diagram</td>
</tr>
<tr>
<td>$x = 105 - 75 = 30°$</td>
<td>A1</td>
<td>Full method required</td>
</tr>
<tr><td colspan="3">Alternative method 2</td></tr>
<tr>
<td>$\angle PCB = 180 - 90 - 15$ or $75°$
or
$\angle PCB = 90 - 15$</td>
<td>M1</td>
<td>oe
Angle may be seen on diagram</td>
</tr>
<tr>
<td>$\angle ABC = \angle PCB =$ their 75
and
$\angle ABP =$ their 75 – 15 or $60°$
and
$\angle BAC = 180 - 90 -$ their 60</td>
<td>M1</td>
<td>oe
Angles may be seen on diagram</td>
</tr>
<tr>
<td>$x = \angle BAC = 30°$</td>
<td>A1</td>
<td>Full method required</td>
</tr>
<tr><td colspan="3">Alternative method 3</td></tr>
<tr>
<td>$\angle PCB = 180 - 90 - 15$ or $75°$
or
$\angle PCB = 90 - 15$</td>
<td>M1</td>
<td>oe
Angle may be seen on diagram</td>
</tr>
<tr>
<td>$\angle ABC = \angle PCB =$ their 75
and
$\angle BAC = 180 -$ their 75 – their 75</td>
<td>M1</td>
<td>oe
Angle may be seen on diagram</td>
</tr>
<tr>
<td>$x = \angle BAC = 30°$</td>
<td>A1</td>
<td>Full method required</td>
</tr>
</table>