BASIC GEOMETRY

Form 1 Regular Course

Vol 4

Part 1 – Angle

1. a: reflex angle
   b: acute angle
   c: acute angle
   d: obtuse angle
   e: acute angle
   f: right angle
   g: obtuse angle

2. (a) The required angle $= \frac{10}{12} \times 360° = 300°$

   (b) Suppose the second hand is pointing at "12".

   The acute angle between the minute hand and the second hand

   $= \frac{6}{60} \times 360° = 36°$

   Consider that 6 minutes $= 0.1$ hour, the hour hand would not point exactly at "10".

   Instead, it will move $0.1 \times \frac{5}{60} \times 360° = 3°$ clockwise than when it is 10:00.

   Therefore, the acute angle between the hour hand and the second hand

   $= \frac{12-10}{12} \times 360° - 3° = 57°$

   Hence, the required angle $= 360° - 36° - 57° = 267°$

Part 2 – Relationship between angles

1.	A	2.	B	3.	A	4.	C	5.	B
6.	D	7.	B	8.	C	9.	D		

1. A

The required angle $= 180° - 40° - 63° = 77°$ (adj. $\angle$s on st. line)

2. B

$2x + 20° + 90° + 3x = 180°$ (adj. $\angle$s on st. line)

$x = 14°$

3. A

$2x + 2y + 2x + 2y = 180°$ (adj. $\angle$s on st. line)

$4x + 4y = 180°$

$x + y = \frac{180°}{4} = 45°$

4. C

$\angle AOB = 70° - \angle BOC$

$\angle AOB + \angle BOD = 180°$ (adj. $\angle$s on st. line)

$70° - \angle BOC + 130° = 180°$

$\angle BOC = 20°$

5. B

$a = 360° - 108° - 78° - 45° = 129°$ ($\angle$s at a pt.)

6. D

$x + 36° + x + 54° + x + 90° = 360°$

$x = 60°$

Thus, the largest angle $= x + 90° = 150°$

7. B

$4x + 90° + x + y = 360°$ ($\angle$s at a pt.)

$y = 270° - 5x = 170°$

8. C

$4x + 20° + x - 10° + x - 10° + 90° = 360°$ ($\angle$s at a pt.)

$6x = 270°$

$x = 45°$

9. D

$\angle BOD = 280° - \angle DOC$

$230° + 280° - \angle DOC = 360°$ ($\angle$s at a pt.)

$\angle DOC = 150°$

10. $\angle ABC = \dfrac{\angle CBD}{2}$

$\angle CBD + \dfrac{\angle CBD}{2} = 180°$ (adj. $\angle$s on st. line)

$\angle CBD = 120°$

11. (a) $3x + 18° + 6x = 180°$ (adj. $\angle$s on st. line)

$9x = 162°$

$x = 18°$

(b) $\angle BOC + \angle BOD$

$= 6(18°) + 81°$

$= 189° \neq 180°$

Thus, COD is not a straight line.

12. (a) $a + b + 2a = 180°$ (adj. $\angle$s on st. line)

$b = 180° - 3a$

(b) If $b = 2a$,

$2a = 180° - 3a$

$a = 36°$

$b = 72° \neq 90°$

Thus, OP is not perpendicular to OQ.

13. (a) $\angle DOE = 4m$ (vert. opp. $\angle$s)

$3m - 20° + 4m + m + 40° = 180°$ (adj. $\angle$s on st. line)

$8m = 160°$

$m = 20°$

(b) $\angle COF = 4(20°) = 80° \neq 90°$

Therefore, CD is not perpendicular to EF.

Part 3A – Triangle (A)

1. $3x+2x+10°+3x+10°=180°$ ($\angle$ sum of Δ)
   $x=20°$

2. $x+x+50°=180°$ ($\angle$ sum of ΔABD)
   $x=65°$
   $x+y+50°+30°=180°$ ($\angle$ sum of ΔABC)
   $y=35°$

3. $y+x-y+x+10°=180°$ ($\angle$ sum of ΔABC)
   $x=85°$

   Since $AB=AC$,
   $\angle ABC=\angle ACB$
   $y=85°-y$
   $y=42.5°$

   $y+70°+z=180°$ ($\angle$ sum of ΔBCD)
   $z=67.5°$