Geometry Book Answers

3 Angles in polygons

1. a) $(4-2) \times 180° = 360°$

   b) $(8-2) \times 180° = 1080°$

   c) $(9-2) \times 180° = 1260°$

2. B. 60, 80, 90, 130

   c. 50, 80, 105, 125

3. $y = \dfrac{360}{6} = 60°$

4. $4 \times 115° = 460°$

   . Sum of angles $= (5-2) \times 180°$
   $$= 540°$$

   . fifth angle $= 540 - 460$
   $$= 80°$$

5. Sum of angles $= (5-2) \times 180°$
   $$= 540°$$

   . fifth angle $= 540 - (110 \times 2 + 90 \times 2)$
   $$= 540 - (220 + 180)$$
   $$= 540 - 400$$
   $$= 140°$$

6 a) angle $= 540 - (120 + 125 + 100 + 85)$
   $$= 540 - 430$$
   $$= 110°$$

b) other angles $= 540 - (3 \times 100)$
   $$= 540 - 300$$
   $$= 240°$$

. The sum of other equal angles $= 240°$

. Each angle $= \dfrac{240}{2} = 120°$

c) Sum of angles of hexagon $= (6-2) \times 180$
   $$= 720°$$

. 6th angle $= 720° - (5 \times 120°)$
   $$= 720° - 600$$
   $$= 120°$$

Yes, regular hexagon because all interior angles are equal in measure

7. Sum of angles $= 360°$

   . $360 - 130 = 230°$

   $360 - (230 + 40) = 90$

   $x = 90/2 = 45$

8. 3rd angle $= 180 - (60 + 45)$
   $$= 75°$$

   exterior angles $= 105°$
   $$= 135°$$
   $$= 120°$$

(10)

183

9. Sum of angles $= (5-2) \times 180$
$$= 540°$$

$x = 540 - (160 + 90 + 90 + 115)$
$$= 540 - 455$$
$$= 85°$$

10. Sum of angles $= (6-2) \times 180$
$$= 720°$$

$y = 720 - (90 + 130 + 110 + 170 + 75)$
$$= 720 - 575$$
$$= 145°$$

11. <u>Interior angles</u>

1st angle $= 180 - 105 = 75°$

2nd angle $= 180 - 62 = 118°$

3rd angle $= 180 - 53 = 127°$

So, $a = 360 - (75 + 118 + 127)$
$$= 360 - 320$$
$$= 40°$$

<u>or</u>

Exterior angle $= 360 - (105 + 62$
at a $\qquad + 53)$
$$= 360 - 220$$
$$= 140°$$

So, $a = 180 - 140 = 40°$

12. Sum of angles of pentagon $= (5-2) \times 180$
$$= 540°$$

· Measure of each Interior angle $= \dfrac{540}{5} = 108°$

· Sum of angles at a point $= 360°$

So, $y = 360 - (108 \times 3)$
$$= 360 - 324$$
$$= 36°$$

13. In rhombus, each 2 opposite angles are equal

$x = \dfrac{180 - 110}{2} = 35°$

$p = 180 - 35°$
$$= 145°$$

(11)

14. a) Sum of angles = $(5-2) \times 180$
$$= 540°$$

so, $x + 3x + (2x+20) + 120 + 2x$
$$=$$
$$540°$$

$8x + 140 = 540°$
$8x = 540 - 140$
$8x = 400 \div 8$
$x = 50$

b) Largest angle = $3x$
$$= 3 \times 50$$
$$= 150°$$

15. a) Sum of angles = $540°$

$y + (y+20) + (y+30) + (y+40)$
$+ (y+50)$ $= 540°$

$5y + 140 = 540°$
$5y = 540 - 140$
$5y = 400 \div 5$
$y = 80$

b) Largest angle = $y + 50$
$$= 80 + 50$$
$$= 130°$$

16. In order to meet at a point, so the sum of angles at this point must be equal to 360°

• Each angle of square = 90°

• Each angle of equilateral triangle $= 60°$

$90 \times 1 + 3 \times 60 = 90 + 180$
$$= 270°$$
equal to 360°

so. Yes, they meet at one point

17. Sum of angles = $(5-2) \times 180°$
$$= 540°$$

$x + (x+20) + (x+20) + (x+40) \times 2 = 540$

$3x + 60 + (2x+80) = 540$

$5x + 140 = 540$
$5x = 540 - 140$
$5x = 400 \div 5$
$x = 80$

18. $a = 180 - 130 = 50°$

$b = 180 - 130 = 50°$

$c = 180 - 50 = 130°$

$d = 180 - 50 = 130°$

· $a + b + c + d = 50 + 50 + 130 + 130$

$= 360°$

19. Sum of angles $= (40 - 2) \times 180$

$= 6840°$

a) $n = \dfrac{360}{15} = 24$ sides

   ↓
number
of
sides

b) $\dfrac{(n-2) \times 180}{n} = 140°$ $(\times n)$

$(n-2) \times 180 = 140n$

$180n - 360 = 140n$

$180n - 140n = 360$

$40n = 360 \div 40$

$n = 9$ sides

c) $n = \dfrac{360}{18} = 20$ sides

· sum of interior angles $= (20-2) \times 180$

$= 3240°$

20.

measure of interior
angle of regular
octagon $= \dfrac{(8-2) \times 180}{8}$

$= \dfrac{1080}{8}$

$= 135°$

So, $(135 \times 2) + 90 = 270 + 90$

$= 360°$

yes, They fit at a point

21. Sum of angles $= (6-2) \times 180$

$= 720°$

$2x = 720 - (150 + 150 + 130 + 90)$

$2x = 720 - 520$

$2x = 200 \div 2$

$x = \dfrac{200}{2} = 100°$

(13)

22. Measure of each angle in a regular Pentagon $= \dfrac{(5-2)\times 180}{5}$

$= \dfrac{540}{5}$

$= \underline{108°}$

to find the measure of the interior angle of the unknown shape,

$360 - (2\times 108)$

$= 360 - 216 = 144°$

• To get number of sides :

$\dfrac{(n-2)\times 180}{n} = 144 \qquad \times(n)$

$(n-2)\times 180 = 144n$

$180n - 360 = 144n$

$180n - 144n = 360$

$36n = 360 \quad \div(36)$

$n = \dfrac{360}{36} = 10$

number of sides $= 10$

so, It's a decagon

23. measure of interior angle of hexagon $= \dfrac{(6-2)\times 180}{6}$

$= \dfrac{720}{6}$

$= 120°$

measure of Interior angle of octagon $= \dfrac{(8-2)\times 180°}{8}$

$= \dfrac{1080}{8}$

$= 135°$

$y = 360 - (135 + 120)$

$= 360 - 255$

$= 105°$

24

$x = 112 - 57 = 55°$

"Each 2 opposite angle in a Parallelogram are equal"

$y = 68°$

$m = 360 - 157 = 203°$

$z = 180 - 146° = 34°$

(14)

25. Measure of each angle of a regular octagon $= \dfrac{(8-2) \times 180}{8}$

$= 135°$

• Measure of each angle of a regular hexagon $= \dfrac{(6-2) \times 180}{6}$

$= 120°$

so, $120 + 135 + 90 = 345°$

They don't fit around a point Since the sum of angles is equal to $345°$ not $360°$

26. Yes

Interior angle $= \dfrac{(8-2) \times 180}{8}$

$= \dfrac{1080}{8}$

$= 135°$

27. Interior angle of octagon $= \dfrac{(8-2) \times 180}{8}$

$= 135°$

so, $\angle ABC = 360 - (135 + 135)$

$= 90°$ (right angle)

8. a) $\dfrac{360}{6} = 60°$

b) $\dfrac{360}{10} = 36°$

c) $\dfrac{360}{7} \approx 51.428$

29. yes

Sum of angle in a triangle $= 180$

so, 3 triangles $= 3 \times 180$

$= 540°$

but sum of angles of a square $= (4-2) \times 180$

$= 360°$

so. They are not equal

30. yes

• Sum of angles of any pentagon $= (5-2) \times 180$

$= 540°$

31. number of sides of hexagon $= 6$

so, sum of angles $= (6-2) \times 180$

$= 4 \times 180$

$= 720°$

(15)