Unit 10 · Triangle and Quadrilaterals

ANSWER KEY · FOR TEACHERS

Full marks 26

Give the marks for the points in the marking scheme; an answer in other words that says the same is right.

1 Key words

1. same base → **d.** one side of each figure is the same segment
2. between the same parallels → **e.** the bases on one line, the opposite sides or corners on a line parallel to it
3. congruent → **g.** the same shape and the same size
4. median → **b.** joins a corner to the midpoint of the opposite side, halving the triangle
5. diagonal of a parallelogram → **f.** cuts it into two triangles of equal area
6. height → **c.** the distance between the two parallel lines

Each carries 0.5 mark. K · 3

2 Multiple choice

i. **b.** 20 cm^2 K · 1

Same base AB, between $AB \parallel DC$: the triangle is half the parallelogram, wherever E is on DC.

ii. **b.** 40 cm^2 U · 1

Area = base × height = 8×5. The slanting side is not the height; 48 cm^2 uses it by mistake.

iii. **a.** 24 cm^2 U · 1

Parallelograms on the same base and between the same parallels are equal in area, and a rectangle is a parallelogram.

iv. **b.** $CD \parallel AB$ U · 1

Equal triangles on the same base and the same side of it lie between the same parallels.

v. **a.** They are equal. A · 1

With the height h: the triangle is $\frac{1}{2} \times 10 \times h = 5h$, the parallelogram $5 \times h$.

3 Very short answers

a. MARKING SCHEME K · 1

- ✓ Equal in area.

b. MARKING SCHEME K · 1

- ✓ Half.

4 Short answers

a. MARKING SCHEME U · 2

- ✓ Area of $\triangle BEC = 36$ cm^2, with the reason.
- ✓ $\triangle ABE + \triangle CDE = 36$ cm^2.

b. MARKING SCHEME U · 2

- ✓ Area of $\triangle ABD = 15$ cm^2.
- ✓ Distance 5 cm.

c. MARKING SCHEME A · 2

- ✓ Area of $\triangle QRS = 28$ cm^2, with the reason.
- ✓ The distance 7 cm.

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5 Long answers

a. **ANSWER** A · 4

1. Area of $\triangle ACD$ = area of $\triangle ACE$: same base AC, between $AC \parallel DE$.
2. Area of $\triangle ABC$ + area of $\triangle ACD$ = area of $\triangle ABC$ + area of $\triangle ACE$: adding $\triangle ABC$ to both sides.
3. Area of $ABCD$ = area of $\triangle ABE$: the whole is the sum of its parts.

MARKING SCHEME

- ✓ $\triangle ACD = \triangle ACE$.
- ✓ The reason: the same base AC and the parallels $AC \parallel DE$.
- ✓ $\triangle ABC$ added to both sides.
- ✓ The conclusion, area of $ABCD$ = area of $\triangle ABE$.

b. **ANSWER** A · 4

1. Area of $\triangle APQ$ = area of $\triangle DPQ$: same base PQ, between $PQ \parallel AD$.
2. Area of $\triangle BPQ$ = area of $\triangle CPQ$: same base PQ, between $PQ \parallel BC$.
3. Adding 1 and 2: area of $\triangle APQ$ + area of $\triangle BPQ$ = area of $\triangle DPQ$ + area of $\triangle CPQ$.
4. So area of $\triangle AQB$ = area of $\triangle DPC$.

MARKING SCHEME

- ✓ $\triangle APQ = \triangle DPQ$ with its reason.
- ✓ $\triangle BPQ = \triangle CPQ$ with its reason.
- ✓ The two added.
- ✓ The conclusion.

6 Think

ANSWER HA · 2

No. The theorem works one way only. A triangle with base 6 cm and height 4 cm and one with base 8 cm and height 3 cm both have 12 cm^2, but their bases are different and their heights too.

MARKING SCHEME

- ✓ Not right: equal areas don't need the same base or parallels.
- ✓ A correct example, such as 6×4 and 8×3.

7 Activity: Count the squares

(not marked)

WHAT STUDENTS SHOULD FIND

The rectangle and the parallelogram are 24 squares each (count the parallelogram's half squares in pairs), and each triangle 12 squares, half of them: the three theorems of the unit.

Marks by level	Knowledge	Understanding	Application	Higher ability	Total
Marks	6	7	11	2	**26**

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