

Transversals, Trapezoids, & Parallelograms. Form A

1. In the figure below, line s is parallel to line t , and line p is a transversal crossing both lines s and t . What is the measure of $\angle A$?

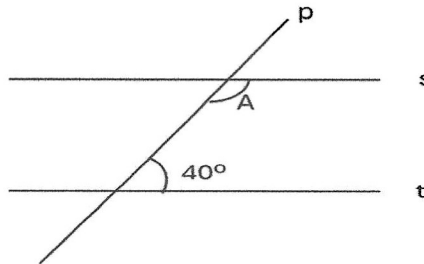
(A) 150°

(B) 140°

(C) 130°

(D) 120°

(E) 110°



Same side interior angles are supplementary which means they add up to 180

so

$$40 + A = 180$$

$$A = 180 - 40 = 140$$

2. In the figure below, line s is parallel to line t , and line p is a transversal crossing both lines s and t . What is value of x ?

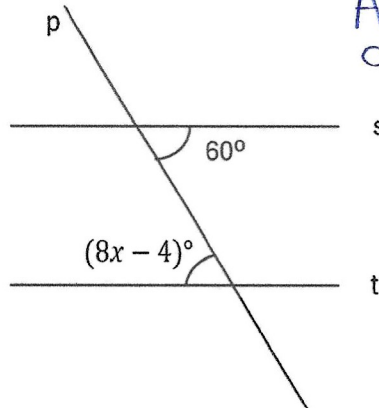
(A) 6

(B) 8

(C) 12

(D) 4

(E) 0



Alternate interior angles are equal to each other

so

$$8x - 4 = 60$$

$$8x = 64$$

$$x = \frac{64}{8} = 8$$

3. In the figure below, line s is parallel to line t , and line p is a transversal crossing both lines s and t . What is value of y ?

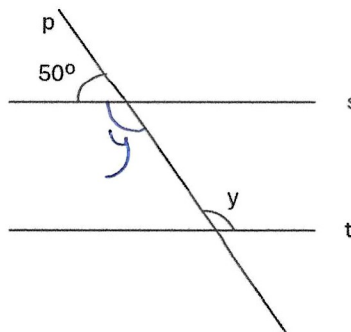
(A) 150°

(B) 140°

(C) 130°

(D) 120°

(E) 110°

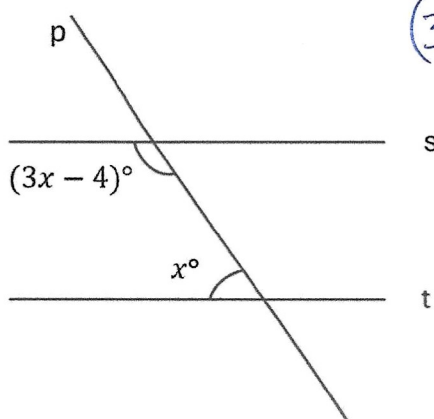


$$50 + y = 180$$

$$y = 130$$

4. In the figure below, line s is parallel to line t , and line p is a transversal crossing both lines s and t . What is the value of x ?

- (A) 46
- (B) 50
- (C) 36
- (D) 20
- (E) 180



Same side interior

$$(3x - 4) + x = 180$$

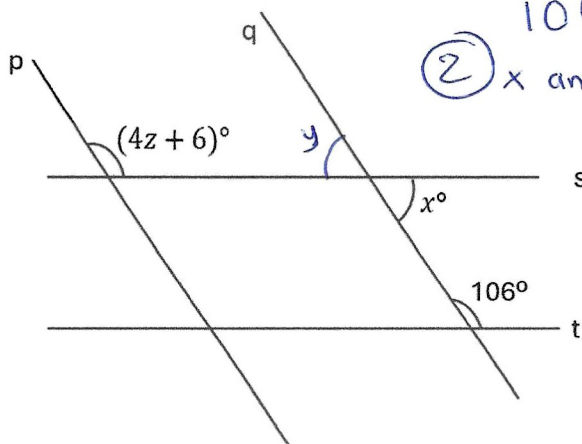
$$4x = 180 + 4$$

$$4x = 184$$

$$x = 46$$

5. In the figure below, line s is parallel to line t , and lines p and q are transversals crossing both lines s and t . What is value of z ?

- (A) 74
- (B) 50
- (C) 17
- (D) 37
- (E) 25



① 106 and x are same side interiors so

$$106 + x = 180 \quad x = 74$$

② x and y are vertical so

$$y = 74$$

③ $4z + 6$ and y are same side interior so

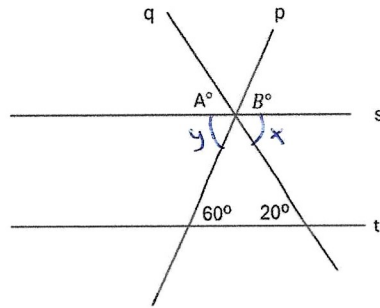
$$(4z + 6) + 74 = 180$$

$$4z = 180 - 80 = 100$$

$$z = 25$$

6. In the figure below, line s is parallel to line t , and lines p and q are transversals crossing both lines s and t and creating a triangle. The measures of angles are as marked. What is value of $B - A$?

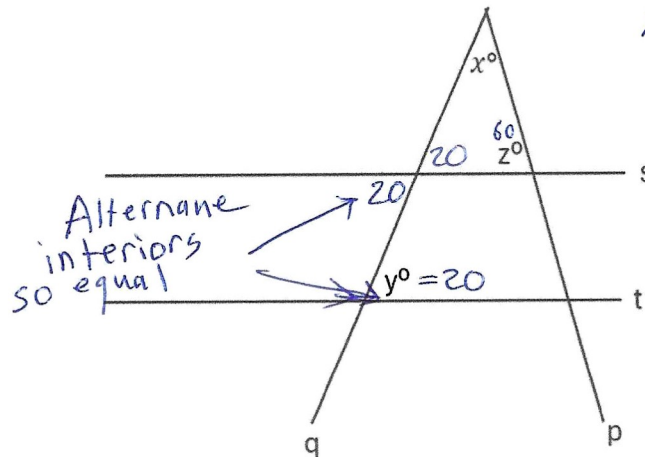
- (A) 80°
- (B) 60°
- (C) 40°
- (D) 120°
- (E) 60°



20° and x are alternate
interiors so $x = 20$
same for 60 and y
so $y = 60$
 x and A are vertical
so $A = x = 20$
 y and B are vertical
so $B = y = 60$
 $B - A = 60 - 20 = 40$

7. In the figure below, line s is parallel to line t , and lines p and q are transversals crossing both lines s and t . For $y = 20^\circ$, and $z = 60^\circ$. What is value of x ?

- (A) 100°
- (B) 80°
- (C) 45°
- (D) 120°
- (E) 110°

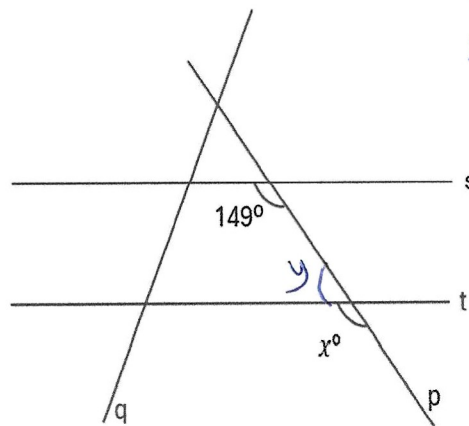


$$x + 20 + 60 = 180$$

$$x = 180 - 80 = 100$$

8. In the figure below, line s is parallel to line t , and lines p and q are transversals crossing both lines s and t . The measures of angles are as marked. What is value of x ?

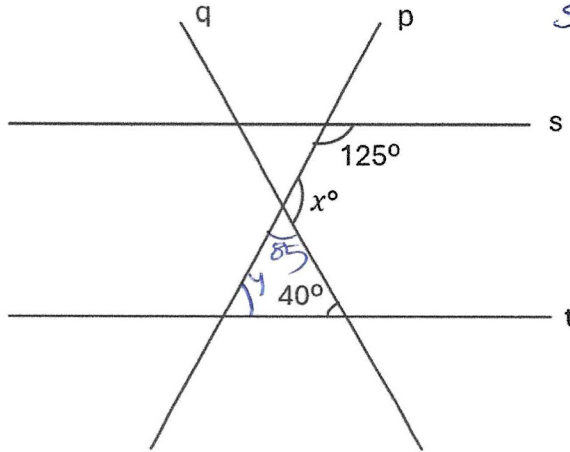
- (A) 31°
- (B) 149°
- (C) 147°
- (D) 181°
- (E) 110°



149 and y are same
Side interiors
 $149 + y = 180$
 $y = 31$
 $31 + x = 180$
 $x = 180 - 31 = 149$

9. In the figure below, line s is parallel to line t , and lines p and q are transversals crossing both lines s and t . The measures of angles are as marked. What is value of x ?

- (A) 55°
- (B) 165°
- (C) 95°
- (D) 100°
- (E) 195°



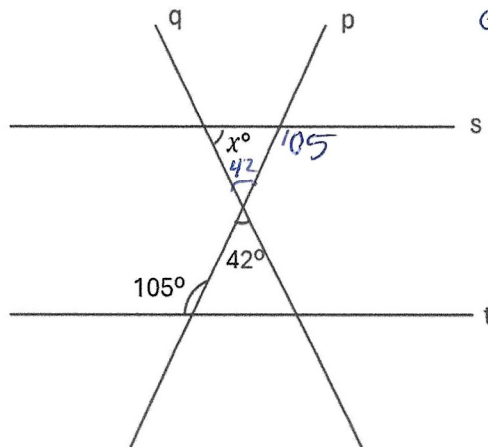
① 125 and y are same side interiors so $y + 125 = 180$

② $y = 55$
For \triangle $\begin{matrix} 85 \\ 55 \end{matrix}$ 40

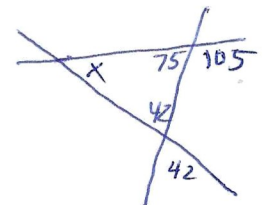
③ $x + 85 = 180$
 $x = 180 - 85 = 95$

10. In the figure below, line s is parallel to line t , and lines p and q are transversals crossing both lines s and t . The measures of angles are as marked. What is value of x ?

- (A) 42°
- (B) 57°
- (C) 63°
- (D) 75°
- (E) 105°



The 105s are alternate interiors



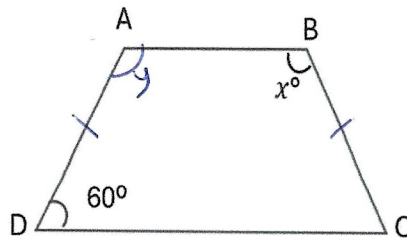
$$x + 75 + 42 = 180$$

$$x = 180 - 117 = 63$$

11. In the isosceles trapezoid ABCD below, \overline{AB} is parallel to \overline{DC} . The measures of angles are as marked. What is value of x ?

Top angles are equal
+ bottom angles are equal

- (A) 140°
- (B) 108°
- (C) 102°
- (D) 60°
- (E) 120°



$$60 + y = 180$$

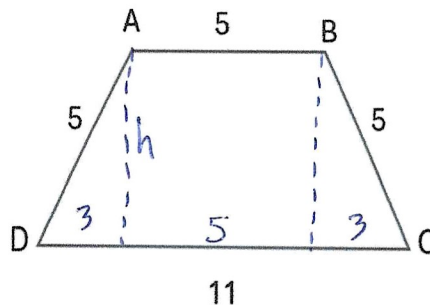
same side internal angles

$$y = 120$$

so $x = 120$ since top angles of isosceles trapezoid are equal

12. In the trapezoid ABCD below, \overline{AB} is parallel to \overline{DC} . The measures of sides are as marked in inches. What is the area of the trapezoid in square inches?

- (A) 22.5
- (B) 50
- (C) 64
- (D) 20
- (E) 32



$$h = 4$$

since we have 5-4-3 triangle

$$5^2 = 3^2 + h^2$$

$$h^2 = 25 - 9 = 16$$

$$h = 4$$

$$A = \frac{a+b}{2} h$$

$$= \frac{5+11}{2} \cdot 4 = 32$$

13. What's the area of a trapezoid of a height of $2x$, and the small and large bases are $\frac{2x}{b}$ and $\frac{4x}{a}$ respectively.

- (A) $16x^2$
- (B) $12x^2$
- (C) $6x^2$
- (D) $8x^2$
- (E) $32x^2$

$$A = \frac{a+b}{2} h$$

$$= \frac{(2x) + (4x)}{2} \cdot 2x$$

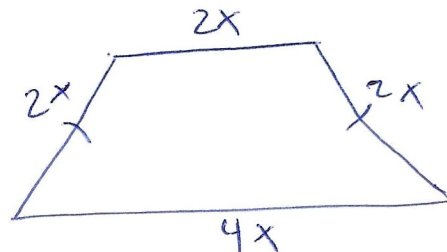
$$= \frac{6x}{2} \cdot 2x = 6x^2$$

14. What's the perimeter of an isosceles trapezoid of a leg length of $2x$, and the small and large bases are $2x$ and $4x$ respectively.

- (A) $16x$
- (B) $8x$
- (C) $20x$
- (D) $10x$
- (E) $5x$

$$P = 2x + 2x + 2x + 4x$$

$$= 10x$$



15. In the ABCD parallelogram given below, the lengths are all in miles. What is the area of the parallelogram in square miles?

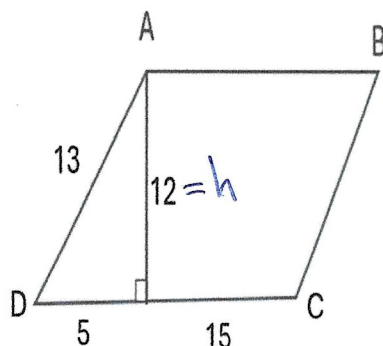
(A) 240

(B) 130

(C) 180

(D) 260

(E) 30



$$A = bh \quad h = 12$$

$$b = 5 + 15 = 20$$

$$A = (12)(20) = 240$$

16. In the ABCD parallelogram given below, the lengths are all in inches. What is the area of the parallelogram in square inches?

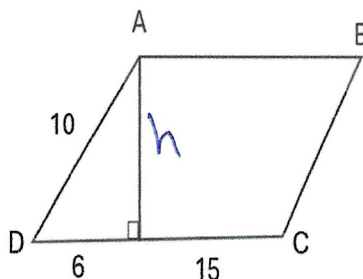
(A) 240

(B) 168

(C) 210

(D) 150

(E) 75



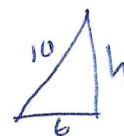
$$A = bh$$

$$10^2 = 6^2 + h^2$$

$$h^2 = 100 - 36$$

$$h^2 = 64$$

$$h = 8$$



$$A = (6 + 15)(8) = 168$$

17. In perimeter of the ABCD parallelogram given below is 50 inches. What is the length in inches of side DC?

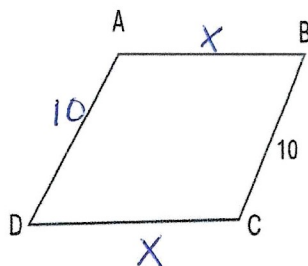
(A) 35

(B) 20

(C) 40

(D) 15

(E) 75



$$10 + x + 10 + x = 50$$

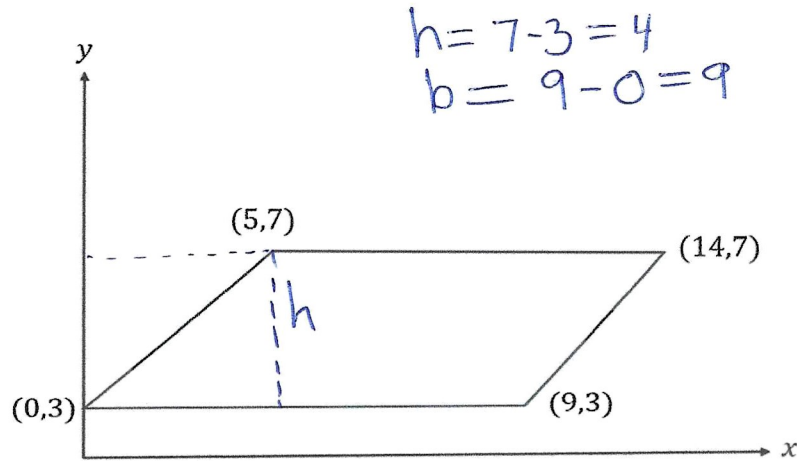
$$2x + 20 = 50$$

$$2x = 30$$

$$x = 15$$

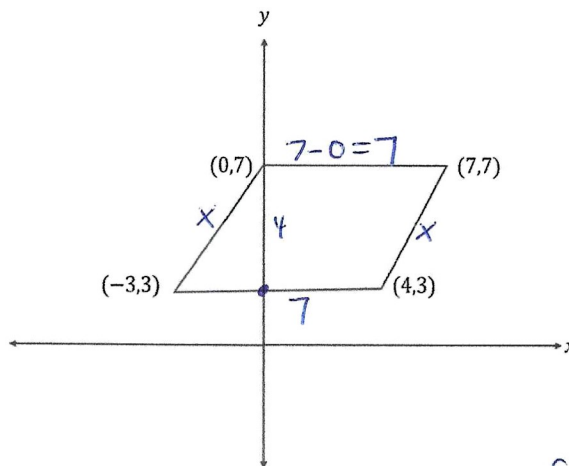
18. The parallelogram below is shown in the standard (x, y) coordinate plane with the vertices as indicated. What is the area of the parallelogram in square units?

- (A) 35
- (B) 24
- (C) 12
- (D) 15
- (E) 36

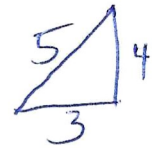


19. The parallelogram below is shown in the standard (x, y) coordinate plane with the vertices as indicated. What is the perimeter of the parallelogram in square units?

- (A) 12
- (B) 28
- (C) 49
- (D) 21
- (E) 9



can solve using for x geometry

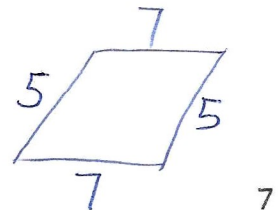


or can use distance formula to find x

$$\begin{matrix} x_1 & y_1 & x_2 & y_2 \\ (0, 7) & & (-3, 3) & \end{matrix} \quad d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$d = \sqrt{(-3 - 0)^2 + (3 - 7)^2} = \sqrt{9 + 16} = 5$$

$$\begin{aligned} \text{Perimeter} &= 7 + 5 + 7 + 5 \\ &= 10 + 14 = 24 \end{aligned}$$



20. The parallelogram below is shown in the standard (x, y) coordinate plane with the vertices as indicated. What is the area of the parallelogram in square units?

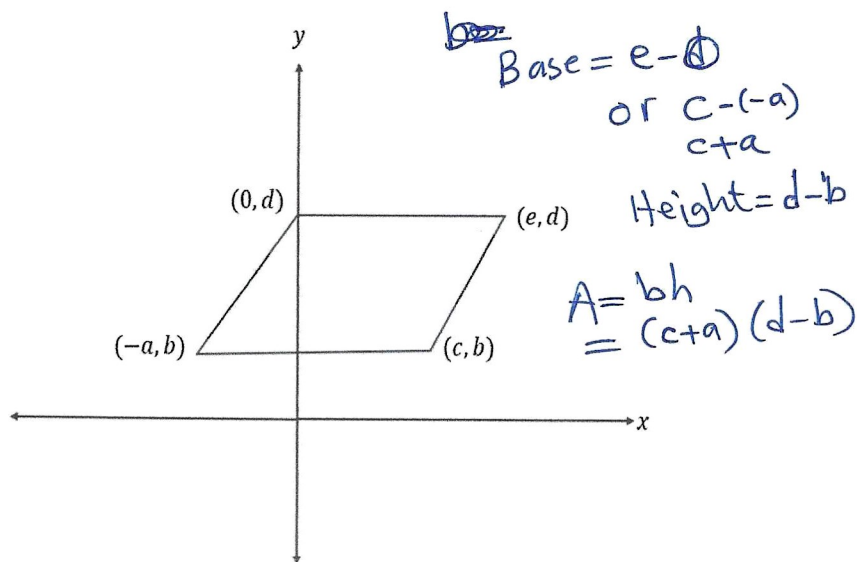
(A) $(c + a)(d - b)$

(B) $\frac{1}{2}(c + a)(d - b)$

(C) $(c - a)(d - b)$

(D) $(c + a)(d + b)$

(E) $\frac{1}{2}(c - a)(d - b)$



- | | |
|-------|-------|
| 1. B | 11. E |
| 2. B | 12. E |
| 3. C | 13. C |
| 4. A | 14. D |
| 5. E | 15. A |
| 6. C | 16. B |
| 7. A | 17. D |
| 8. B | 18. E |
| 9. C | 19. B |
| 10. C | 20. A |