

CHAPTER TEST, P. 210

- a) 77°F b) -3.9°C

c) -40°C d) -31.7°C

e) 207.2°C f) 113°F
- 932°F to 36 032°F
- a) 196 oz b) 4600 lb

c) 2 tn 1284 lb d) 60 oz

e) 10.3 lb f) approximately 1 lb
- 140 318 trees
- 1 lb 7 oz
- 6.25 lb, or 6 lb 4 oz
- 14 eggs
- 1571 kg
- approximately 1.2 tonnes

CHAPTER 5
ANGLES AND PARALLEL LINES
5.1 MEASURING, DRAWING, AND ESTIMATING ANGLES

BUILD YOUR SKILLS, P. 214

- a) acute b) reflex

c) obtuse d) acute

e) straight f) obtuse

g) reflex h) reflex
- $\angle A$ measures about 40° .

$\angle B$ measures about 75° .

$\angle C$ measures about 65° .

$\angle D$ measures about 10° .
- The angle is about 20° .
- $\angle A$ measures about 140° or 150° .

$\angle B$ measures about 230° or 240° .

$\angle C$ measures about 170° .

$\angle D$ measures about 330° .
- The angle is about 100° .

6. ANGLE COMPLEMENTS AND SUPPLEMENTS

Angle	Complement	Supplement
45°	$90^{\circ} - 45^{\circ} = 45^{\circ}$	$180^{\circ} - 45^{\circ} = 135^{\circ}$
78°	$90^{\circ} - 78^{\circ} = 12^{\circ}$	$180^{\circ} - 78^{\circ} = 102^{\circ}$
112°	Does not exist, because angle is greater than 90° .	$180^{\circ} - 112^{\circ} = 68^{\circ}$
160°	Does not exist, because angle is greater than 90° .	$180^{\circ} - 160^{\circ} = 20^{\circ}$
220°	Does not exist, because angle is greater than 90° .	Does not exist, because angle is greater than 180° .

- 7. a) 32° b) 148°
- 8. a) 90° b) 90°
- 9. 115°
- 10. 180°
- 11. 337.5°

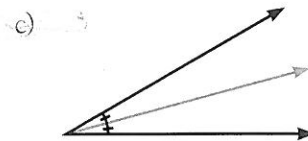
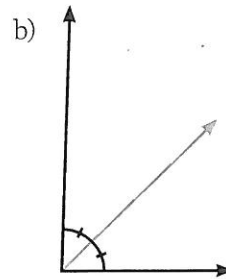
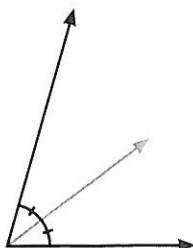
PRACTISE YOUR NEW SKILLS, P. 222

- 1. a) acute b) obtuse
- c) reflex d) obtuse
- e) acute f) reflex
- 2. a) The angle is slightly greater than 60° , about 65° .
- b) The angle is slightly greater than 45° , about 50° .
- c) The angle is about 45° .
- d) Angle x is about 120° , and angle y is about 60° .
- 3. 25°
- 4. $\angle A$ is more than 90° ; it is about 110° .
- 5. a) 175° b) 220°

5.2 ANGLE BISECTORS AND PERPENDICULAR LINES

BUILD YOUR SKILLS, P. 226

- 1. 45°
- 2. a)



- 3. 156°
- 4. 120°
- 5. 3.3°
- 6. approximately 35°
- 7. $a = 45^\circ; b = 50^\circ; c = 55^\circ; d = 30^\circ$

PRACTISE YOUR NEW SKILLS, P. 229

- 1. a) Not perpendicular.
- b) Not perpendicular.
- c) Yes, the lines are perpendicular.
- d) Yes, the lines are perpendicular.
- 2.

ANGLE CALCULATIONS			
Angle	Complement	Supplement	Resulting angle measures after angle is bisected
73°	17°	107°	36.5°
78°	12°	102°	39°
15°	75°	165°	7.5°
48°	42°	132°	24°
90°	0°	90°	45°
68°	22°	112°	34°
41°	49°	139°	20.5°
136°	n/a	44°	68°
80°	10°	100°	40°
254°	n/a	n/a	127°

3. $x = 67.5^\circ, y = 22.5^\circ$

4. a) $y = 110^\circ, x = 70^\circ$

x and y are supplementary.

b) $x = 72^\circ$

c) $x = 99^\circ$

x and the 81° angle are supplementary.

d) $x = 245^\circ$

5. 67.5°

5.3 NON-PARALLEL LINES AND TRANSVERSALS

BUILD YOUR SKILLS, P. 233

- alternate interior angles
 - corresponding angles
 - exterior angles on the same side of the transversal
 - interior angles on the same side of the transversal
- $\angle 6$
 - $\angle 3$
 - $\angle 3$
 - $\angle 3$
- $\angle 7$, using lines ℓ_3 and ℓ_4 with transversal ℓ_1 .
 $\angle 3$, using lines ℓ_1 and ℓ_2 with transversal ℓ_3 .
 - $\angle 4$, using lines ℓ_3 and ℓ_4 with transversal ℓ_2 .
 - $\angle 10$, using lines ℓ_3 and ℓ_4 with transversal ℓ_2 .
 - $\angle 5$, using lines ℓ_3 and ℓ_4 with transversal ℓ_2 .

$\angle 7$, using lines ℓ_1 and ℓ_2 with transversal ℓ_4 .

- CB and BD intersect AB and AD.
- Line t cannot be a transversal because it does not pass through two distinct points. It is concurrent to ℓ_1 and ℓ_2 because they all pass through the same point.
- t and ℓ_3 are intersected by ℓ_1 and ℓ_2 .

PRACTISE YOUR NEW SKILLS, P. 236

- $\angle 3$ and $\angle 5$; $\angle 2$ and $\angle 8$
 - $\angle 1$ and $\angle 5$; $\angle 2$ and $\angle 6$; $\angle 3$ and $\angle 7$; $\angle 4$ and $\angle 8$
 - $\angle 2$ and $\angle 5$; $\angle 3$ and $\angle 8$
- $\angle 3$ and $\angle 5$; $\angle 4$ and $\angle 6$.
- ℓ_3 is the transversal that makes $\angle 1$ and $\angle 2$ corresponding angles for ℓ_1 and ℓ_2 .
 - ℓ_4 is the transversal that makes $\angle 3$ and $\angle 4$ alternate interior angles for ℓ_1 and ℓ_2 .
- $\angle 3 = 95^\circ$
 $\angle 4 = 68^\circ$
 $\angle 5 = 112^\circ$
 $\angle 3 + \angle 4 + \angle 5 = 360^\circ$
- $\angle 1 = 60^\circ$
 $\angle 2 = 120^\circ$
 $\angle 3 = 60^\circ$
 $\angle 4 = 110^\circ$
 $\angle 5 = 70^\circ$
 $\angle 6 = 110^\circ$

5.4 PARALLEL LINES AND TRANSVERSALS

BUILD YOUR SKILLS, P. 240

1. $\angle 1$ and the 71° angle are interior angles on the same side of the transversal.

$$\angle 1 = 109^\circ$$

$\angle 2$ is supplementary to the 118° angle.

$$\angle 2 = 62^\circ$$

$\angle 3$ corresponds to the 118° angle.

$$\angle 3 = 118^\circ$$

$\angle 4$ corresponds to $\angle 2$, and is also supplementary to $\angle 3$.

$$\angle 4 = 62^\circ$$

2. $\angle 1 = 112^\circ$

$$\angle 2 = 68^\circ$$

$$\angle 3 = 68^\circ$$

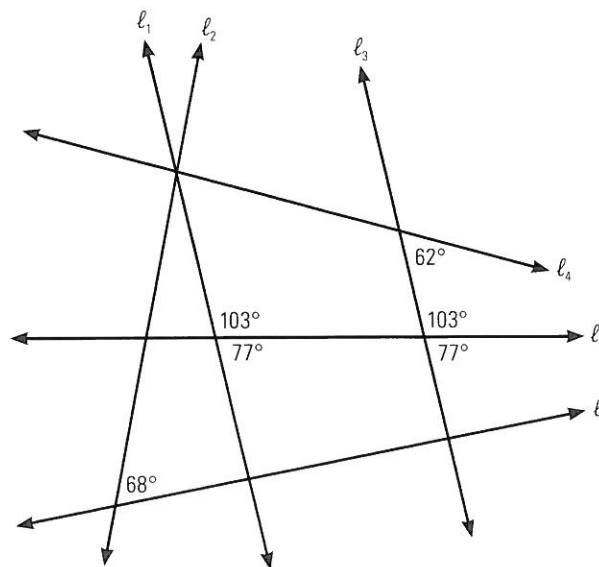
$$\angle 4 = 112^\circ$$

3. $\angle A$ is 106° . It is supplementary to $\angle B$ (74°) because they are interior angles on the same side of the transversal, given parallel lines BC and AD and transversal AB.

$\angle C$ is 106° . It is supplementary to $\angle B$ (74°) because they are interior angles on the same side of the transversal, given parallel lines AB and CD and transversal BC.

$\angle D$ is 74° . It is supplementary to $\angle A$ (106°) because they are interior angles on the same side of the transversal, given parallel lines AB and CD and transversal AD.

4. l_1 and l_3 are parallel.



5. $\angle 1 = 57^\circ$

6. 4°

7. SOLVING ANGLE MEASURES

Angle measure	Reason
$\angle 1 = 54^\circ$	It is vertically opposite the 54° angle.
$\angle 2 = 54^\circ$	It is an alternate interior angle to $\angle 1$.
$\angle 3 = 97^\circ$	It is supplementary to the 83° angle.
$\angle 4 = 83^\circ$	It is an interior angle on the same side of the transversal as $\angle 3$, so is supplementary to it. Also, it is vertically opposite 83° .

8. $\angle 1 = 122^\circ$

$$\angle 2 = 90^\circ$$

9. $\angle 2 = 127^\circ$

PRACTISE YOUR NEW SKILLS, P. 246

1. $\angle 1$ is supplementary to the 112° angle.

$$\angle 1 = 68^\circ$$

$\angle 2$ is supplementary to the 112° angle, and vertically opposite $\angle 1$.

$$\angle 2 = 68^\circ$$

$\angle 3$ is an interior angle on the same side of the transversal as 112° , and is an alternate interior angle to $\angle 2$.

$$\angle 3 = 68^\circ$$

$\angle 4$ is supplementary to the 60° angle.

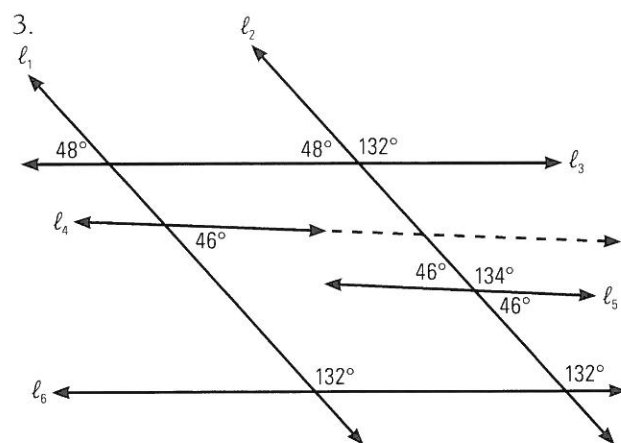
$$\angle 4 = 120^\circ$$

$\angle 5$ is vertically opposite $\angle 3$.

$$\angle 5 = 68^\circ$$

2. $\angle 1 = 57^\circ$

$$\angle 2 = 33^\circ$$



l_1 is parallel to l_2 because, with transversal l_3 , the corresponding angles are equal.

l_3 is parallel to l_6 because, with transversal l_2 , two corresponding angles are 132° .

l_4 is parallel to l_5 because, with transversals l_1 and l_2 , the corresponding angles are equal.

4. The top of stud A must be moved 1° to the right, to change the 89° angle to 90° .

The top of stud B must be moved 1° to the left, to change the 91° angle to 90° .

The top of stud D must be moved 1° to the left, to change the 134° angle to 135° .

CHAPTER TEST, P. 248

1. a) obtuse b) acute
c) reflex d) straight
e) right f) obtuse

2. ANGLE CALCULATIONS

Angle	Complement	Supplement	Resulting angle measures after angle is bisected
58°	32°	122°	29°
94°	Does not exist, because angle is greater than 90° .	86°	47°
87°	Does not exist, because angle is greater than 90° .	93°	43.5°
153°	Does not exist, because angle is greater than 90° .	27°	76.5°
65°	25°	115°	32.5°

3. a) alternate interior angles
b) interior angles on the same side of the transversal
c) vertically opposite angles
d) corresponding angles

4. $\angle 2$ is supplementary to the 62° angle.

$$\angle 2 = 118^\circ$$

$\angle 4$ is vertically opposite to the 62° angle or supplementary to $\angle 2$.

$$\angle 4 = 62^\circ$$

$\angle 3$ is the alternate interior angle to the 62° angle, and is an interior angle on the same side of the transversal as $\angle 2$.

$$\angle 3 = 62^\circ$$

$\angle 1$ is an interior angle on the same side of the transversal to the 67° angle.

$$\angle 1 = 113^\circ$$

5. $\angle 1$ is an interior angle on the same side of the transversal (line A) as $\angle D$ (68°).

$$\angle 1 = 112^\circ$$

$\angle 2$ is the corresponding angle to $\angle C$ (75°), given transversal AC.

$$\angle 2 = 75^\circ$$

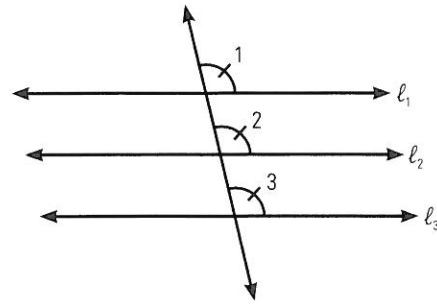
6. $\angle 1 = 23^\circ$

$$\angle 2 = 23^\circ$$

7. a) $\angle 1 = 72^\circ$ b) $\angle 2 = 18^\circ$

8. a) 90° b) 185°

- 9.



Fred is correct. $\angle 1$ is equal to $\angle 3$ and l_1 is parallel to l_3 since the corresponding angles are equal.

10. $\angle 2 = \angle 7$

Using l_1 and l_2 , and transversal t_1 , $\angle 2$ and $\angle 7$ are alternate interior angles.

$$\angle 5 = \angle 7$$

Using l_1 and l_2 , and transversal t_1 , $\angle 5$ and $\angle 7$ are corresponding angles.

$$\angle 4 = \angle 7$$

Using l_1 and l_3 , and transversal t_1 , $\angle 4$ and $\angle 7$ are alternate interior angles.