

1. Which choice correctly identifies the constraints to which the swing set is subjected?

	1	2	3	
A)	Compression	Deflection	Torsion	
B)	Compression	Torsion	Deflection	
C)	Deflection	Tension	Compression	
D)	Deflection	Compression	tension	

2. The orthogonal projection of an object is shown below. Choose the matching isometric projection.

	A)	B)
	C)	D)

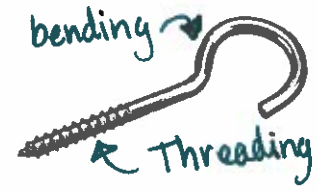
3. A covered bridge is represented below. Choose the corresponding top view.

	A)	B)	C)	D)

4. Building materials made of metal, wood and plastic must be treated to protect them from the degradation caused by harsh weather. Which of the following choices best matches each material with the appropriate treatment?

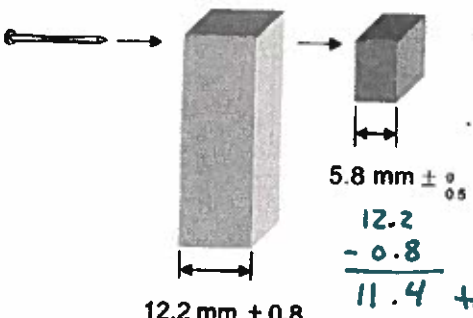
	Metals	Plastics	Wood
A)	Apply oil ✓	Apply varnish	Coat with zinc
B)	Apply varnish	Apply oil	Apply paint ✓
C)	Apply paint ✓	Coat with zinc	Apply oil ✓
D)	Coat with zinc ✓	Add UV blocking pigments ✓	Apply varnish ✓

5. Which machining techniques were required to make the hook shown below?



A) Threading and welding
 B) Tapping and bending
 C) Threading and bending
 D) Tapping and welding

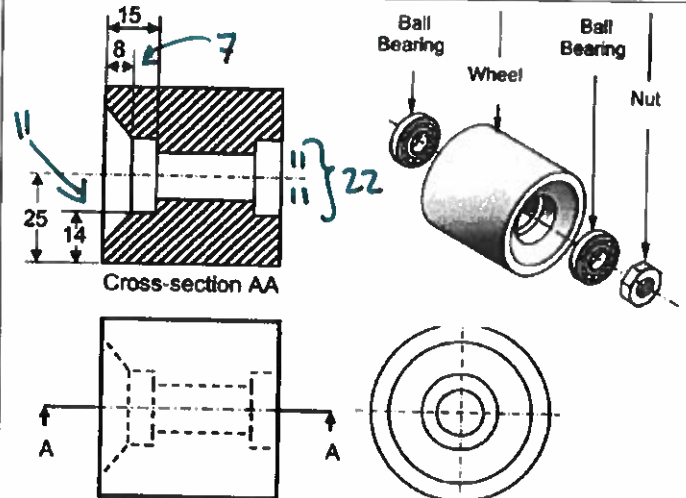
6. Nicole wants to attach two blocks of wood. The nail must be driven into the wood such that the pieces are secured together, without letting its tip come out the other end. What length of nail must she use?



Handwritten notes:
 too small
 large 11.4 to 13.0
 small 5.3 to 5.8
 Smallest it can be 11.4 + 5.3 = 16.7
 too long

A) 11.4 mm
 B) 16.7 mm
 C) 18.0 mm
 D) 18.8 mm

7. Your skateboard makes a rubbing noise when you use it. You decide that the ball bearings in wheels need to be replaced.



Which ball bearing should you order?

Ball Bearing	Dimensions (mm)	
	External diameter	Thickness
A	11	7
B	22	7
C	22	8
D	25	8

8. Annealing is a process that:

- A) Softens steel.
 B) Hardens steel at high temperatures.
 C) Hardens steel at low temperatures.
 D) Slowly heats steel to restore its properties once they have been modified by welding.

Question	Ans
1	C
2	A
3	A
4	D
5	C
6	B
7	B
8	D

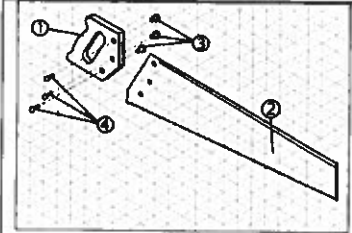
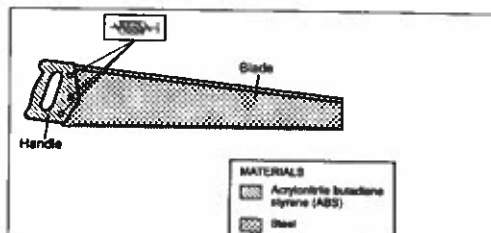
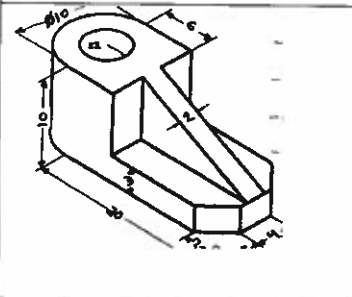
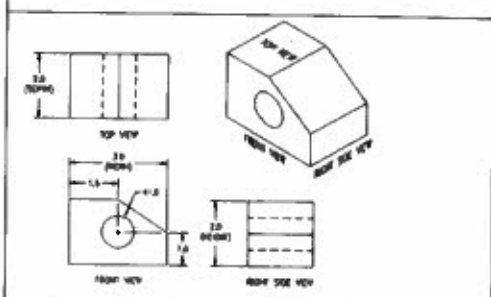
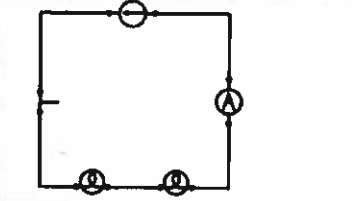
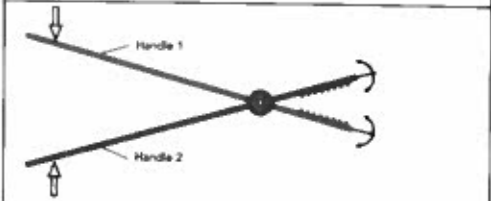
9. Match each of the examples below with a mechanical property. (4)

Hardness Elasticity Resilience Malleability Ductility Electrical conductivity

- a) A material for skis made specially for skiing moguls, with the ability to recover its original shape even after bending between moguls elasticity
- b) Another material for skis, this time with the ability to sustain the shock of landing after a jump. resilience
- c) A material that will bend without breaking to make rain gutters for a house. malleability
- d) Oak is an expensive type of wood flooring because it resists scratches. hardness

10. Match the type of drawing/ projection with the corresponding term. Place the correct # next to the picture. (6)

- 1- Circuit Diagram 2- Design Plan 3- Technical Diagram
- 4- Exploded View 5- General Arrangement 6- Isometric Drawing

	<u>4</u>		<u>3</u>
	<u>6</u>		<u>5</u>
	<u>1</u>		<u>2</u>

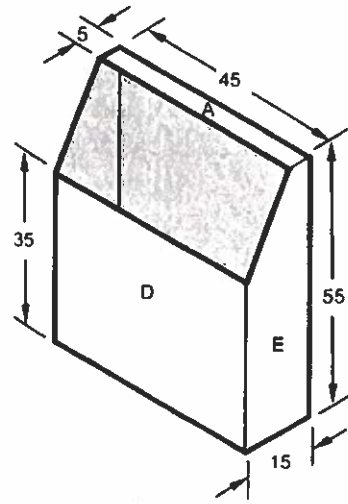
11. Circle the link(guide), motion and force involved in opening & closing this water bottle. (3)



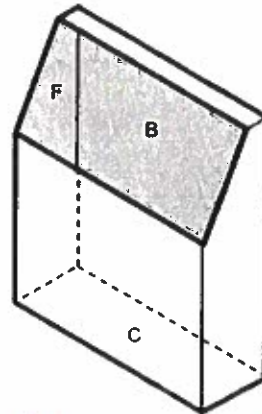
LINK	MOTION	FORCE
X	→	⇌
≡	↔	⇌
≡	↷	⤷
≡	↶	⇕
<u>≡</u>	↷	⇕
	↶	⇕
	↷	⇕

12. Draw the development (net) of the box illustrated below. LABEL each surface with the correct letter.

Box with dimensions



Transparent view of box



(4)

*Careful!
Plan ahead!*

other possibilities exist.

