



Coimisiún na Scrúduithe Stáit
State Examinations Commission

JUNIOR CERTIFICATE EXAMINATION, 2018

METALWORK

TECHNIQUES AND DESIGN – PROJECT – HIGHER LEVEL

150 marks

PROJECT MUST BE COMPLETED BY Friday 13th April, 2018

PLEASE READ CAREFULLY

General Instructions to candidates

The project you make and submit for examination, including the design element, must be **your own individual work**, carried out in the school under the supervision of the teacher.

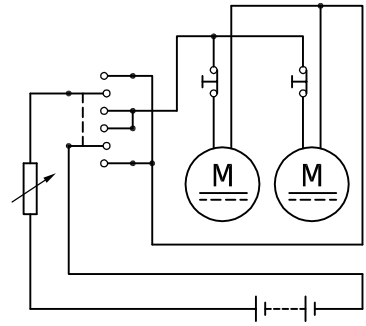
Your own individual work is intended to include the intellectual activity of design along with the practical activities of making the project.

Note: For further information on this project please see the video at the URL shown below.
<https://www.examinations.ie/video/index.php/metalwork2018>

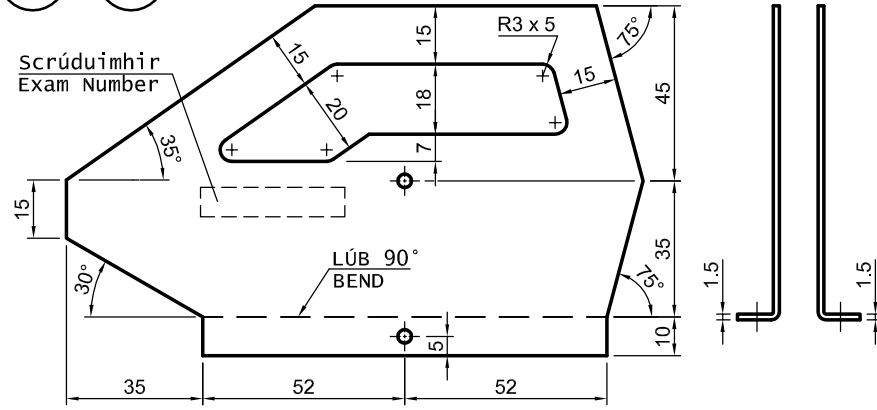
Instructions for making the project

1. Details of a **Model Snowcat** are shown on the accompanying drawing.
2. Make and assemble the Project using the materials specified in the **Parts List**.
Note: The Rear Wheel (**Part 31**) can be bonded to the Rear Half Axle (**Part 28**), if required.
3. (i) Design and make a control console for the model. The control console must contain the electronic components (**Parts 32 - 35**) and be attached to the model using ribbon cable.
(ii) Design, make and attach an adjustable tensioning system for each Caterpillar Track.
Your design solution can include adjustments to already manufactured components.
(Note: 20% of the marks will be awarded for this section.)
4. Complete, **test** and **solder** the **Electric Circuit**.
5. Your **Examination Number** must be clearly shown in the position indicated on the drawing.
6. Your completed project, clearly identified with your **Examination Number**, must be available to the visiting examiner **along with the necessary testing equipment**.

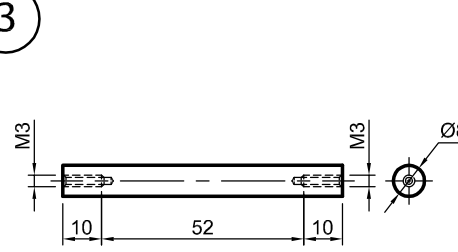
LÉARÁID LEICTREACH
WIRING DIAGRAM



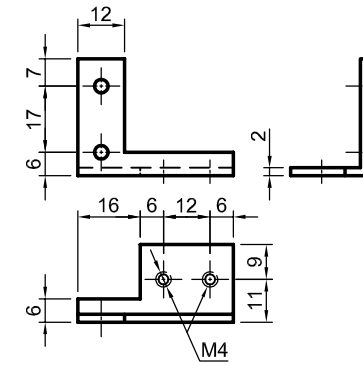
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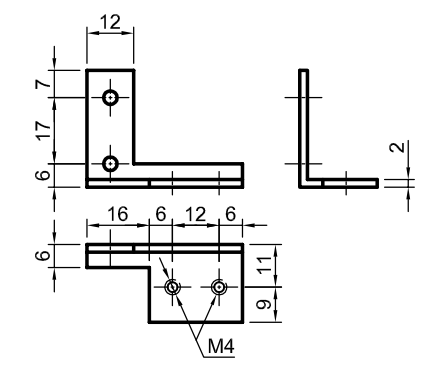
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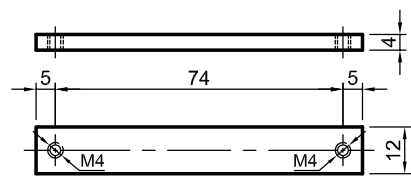


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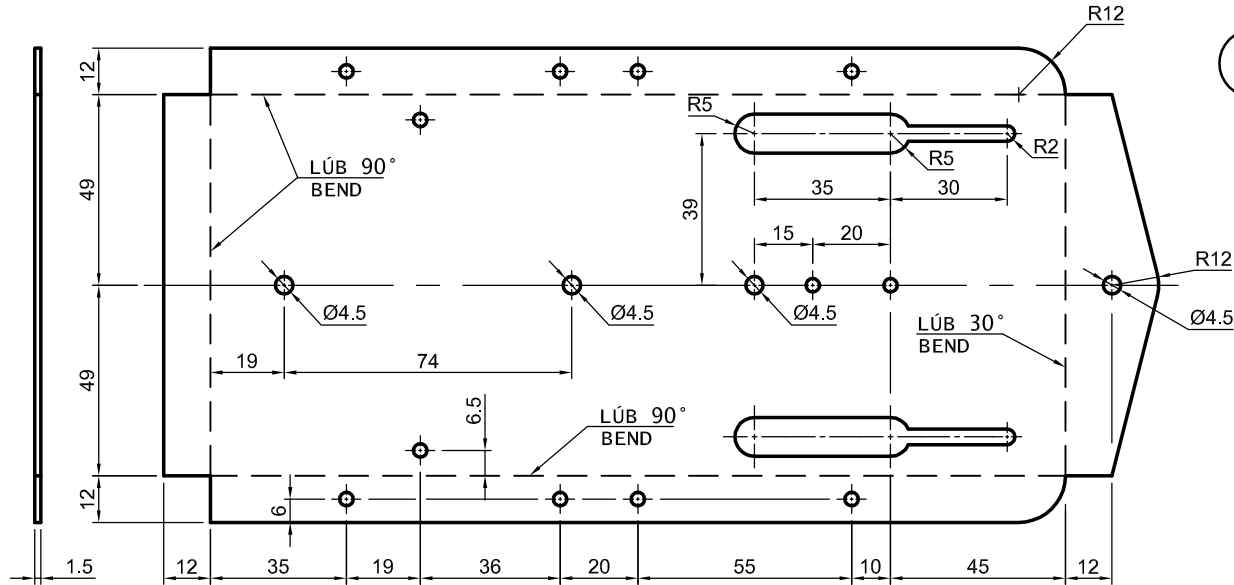


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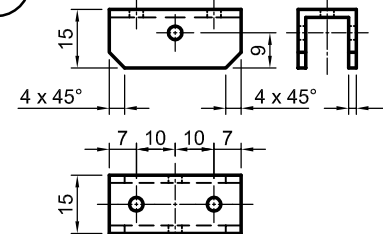
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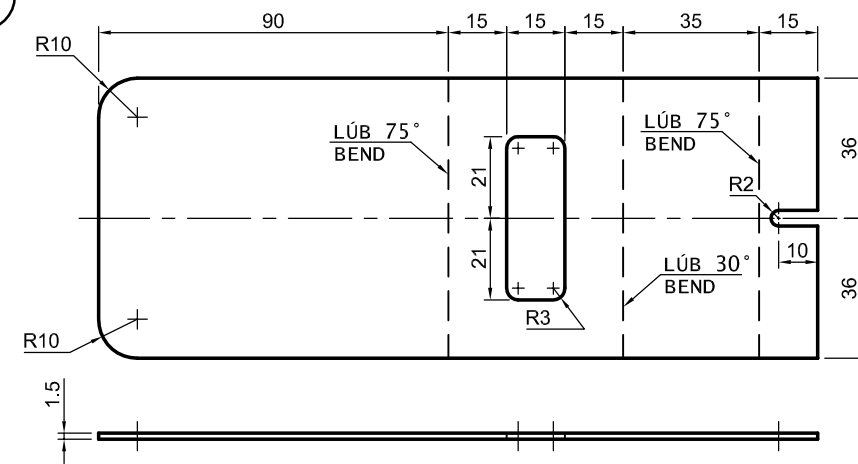
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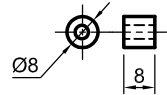
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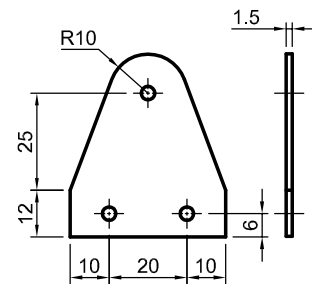
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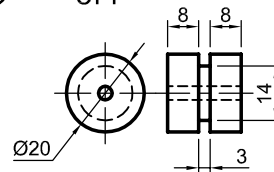
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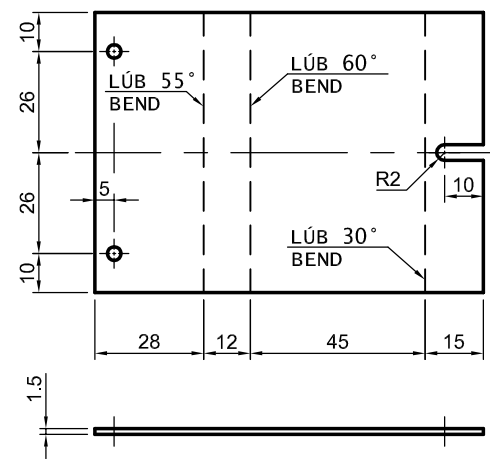


Poill gan toisí
Undimensioned holes Ø3.5

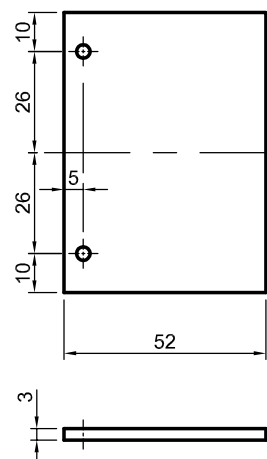
Nóta: Gabhann 20% de na marcanna le Cóimeáil, Bailchríoch agus Feidhmiú.

Note: 20% of the marks will be awarded for Assembly, Finish and Function.

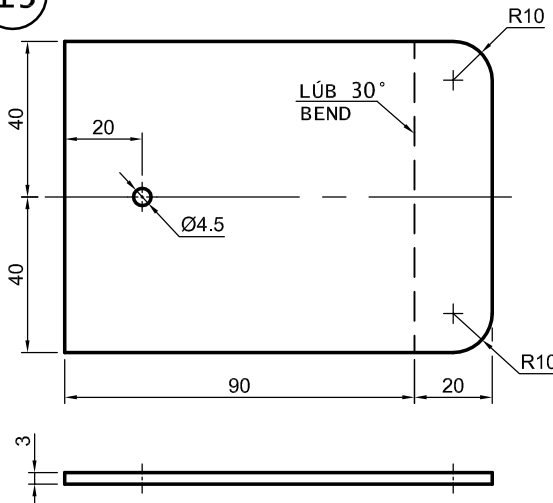
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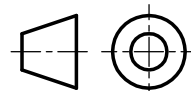
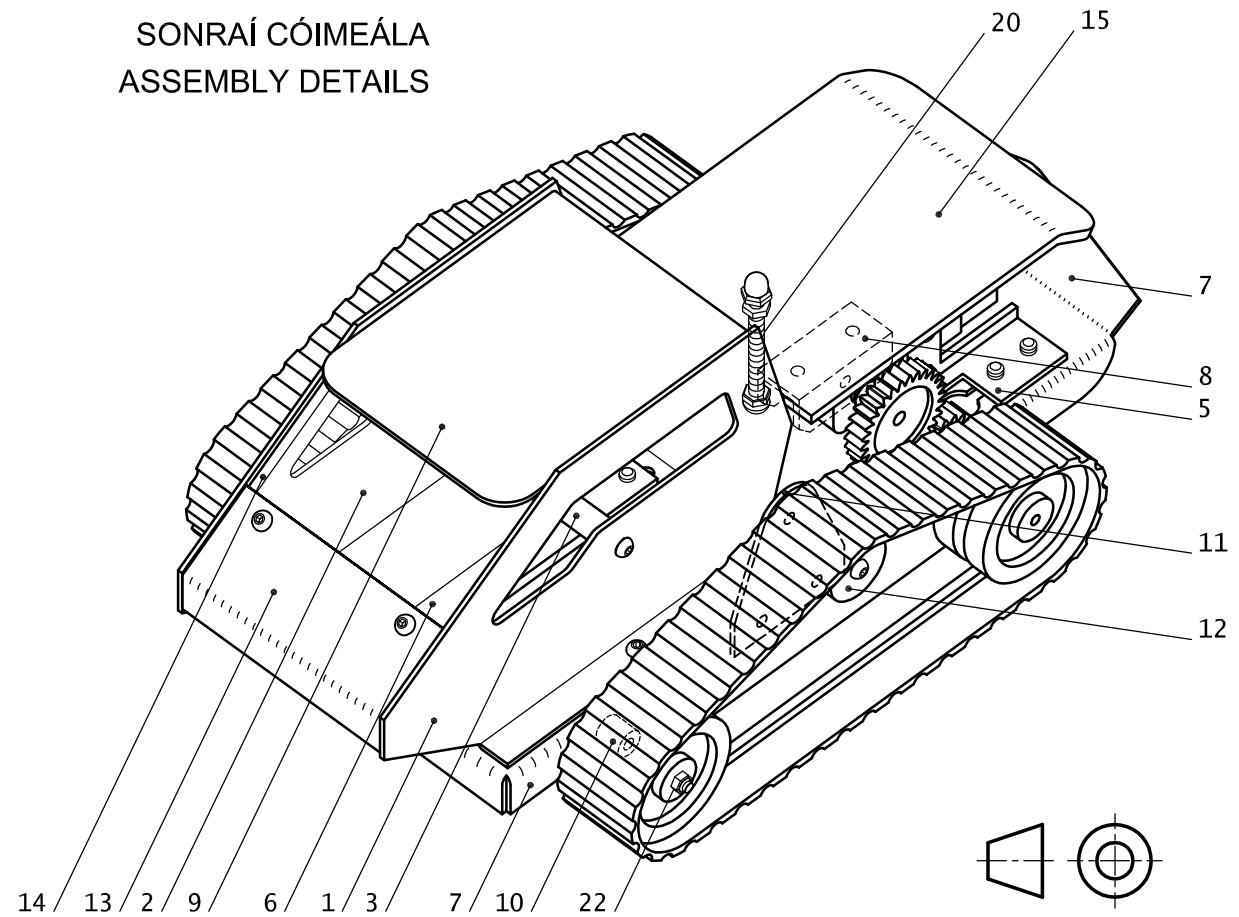
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SONRAÍ CÓIMEÁLA
ASSEMBLY DETAILS



Parts List			
Part No.	Part Name	Required	Material and Description
1	Left Side Panel	1	1.5 mm, Aluminium (polished or painted)
2	Right Side Panel	1	1.5 mm, Aluminium (polished or painted)
3	Side Panel Support	1	Ø8 mm, Aluminium (polished)
4	Right Motor Support	1	30 × 30 × 2 mm, Aluminium Angle (polished)
5	Left Motor Support	1	30 × 30 × 2 mm, Aluminium Angle (polished)
6	Plate Nut	1	4 mm, Aluminium (polished)
7	Chassis	1	1.5 mm, Aluminium (polished or painted)
8	Half Axle Support	1	15 × 15 × 15 × 2 mm, U-Aluminium (polished)
9	Roof/Rear Panel	1	1.5 mm, Aluminium (polished or painted)
10	Front Wheel Spacer	2	Ø8 mm, Brass (polished)
11	Track Wheel Support	2	1.5 mm, Aluminium (polished or painted)
12	Track Wheel	2	Ø20 mm, Nylon, PVC or Acetal (polished)
13	Front Panel	1	1.5 mm, Aluminium (polished or painted)
14	Windscreen	1	3 mm, Tinted Acrylic (polished)
15	Transmission Cover	1	3 mm, Coloured Acrylic (polished)
As Supplied			
16	Screw	12	M3 × 8, Pan Head or Allen Button Head, Steel
17	Screw (Motor)	4	M3 × 25, Pan Head or Allen Button Head, Steel
18	Screw (Track Wheel)	2	M3 × 30, Pan Head or Allen Button Head, Steel
19	Screw	6	M4 × 6, Pan Head or Allen Button Head, Steel
20	Screw	1	M4 × 40, Pan Head or Allen Button Head, Steel
21	Nut	18	M3, Steel
22	Nylock Nut	2	M3, Steel
23	Nut (Part 20)	2	M4, Steel
24	Cap Nut	1	M4, Steel
25	3V Motorised Gearbox	2	In-Line Motor / 120:1 Ratio
26	Motor Gear	2	Plastic Gear – 30 Teeth – to suit Gearbox Spigot
27	Axle Gear	2	Plastic Gear – 20 Teeth – 3 mm axle hole
28	Rear Half Axle	2	Ø3 Steel Rod (76 mm approximately)
29	Front Axle	1	M3 Threaded Bar (162 mm approximately)
30	Caterpillar Track	2	30 mm × 180 mm approximately
31	Wheel	4	Ø38 mm; 3 mm axle hole (to suit Caterpillar Track)
32	Battery Holder	1	AA × 3
33	Potentiometer + Knob	1	5 Watt, 50 Ω, Wire-Wound
34	Switch	1	DPDT
35	Switch	2	Push to Break

Note: 20% of the marks are awarded for **Assembly, Finish and Function.**