



# Knots and Anchors

Nashville Grotto  
Practice Preparation



# Ropes and Webbing

The most commonly used rope for caving is 7/16" (11mm) static rope.  
The most commonly used webbing is 1" tubular webbing.

Technical Use is rated for one person loads at a 15:1 safety factor.  
General Use is rated for two person loads with a 15:1 safety factor.

Approximate/Average Load Ratings by Size		
Diameter / Size	Kilo Newtons	Pound-Force
8 mm (5/16")	~ 15 kN	~ 3500 lbf
9 mm (3/8")	~ 20 kN	~ 4500 lbf
11.1 mm (7/16")	~ 30 kN	~ 7000 lbf
12.7 mm (1/2")	~ 40 kN	~ 9000 lbf
25 mm (1") tubular webbing	~ 18 kN	~ 4000 lbf



# Rope Care Tips

- Avoid shock loading static ropes.
- Avoid stepping on the rope if possible.
- Avoid cleaning with chlorine bleach or chemicals.
- Wash rope after use in dirty environments.



# Rope Care Tips

- Do not dry in a clothes dryer.
- Store in a rope bag if possible.
- Don't glaze the rope with high friction rappels.
- Protect the rope from all sharp edges.
- Avoid buying a used rope for lifeline purposes.



# Rope Care Tips

- Before and after every use, a rope should be inspected along its entire length.
- Feel the rope for changes in diameter (swelling or shrinking), cuts, or extreme abrasion. Any bad spots should be cut out and discarded.
- If the rope has taken a hard fall (shock loaded) or used for some nonstandard application (such as towing a car), it should be retired.



# Knot Terminology

- **Bend** – Tie that brings together two rope ends.
  - **Bight** – Doubled section of rope that doesn't cross itself.
  - **Loop** – Turn of the rope that crosses itself.
  - **Hitch** – Group of ties that wrap or attach to other objects or ropes.
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- **Dressed** – Tie with all components properly aligned.
  - **Setting** – Tightening all parts of a tie.
  - **Working End** – End of rope used to fasten to an anchor
  - **Running End** – End of rope that is not rigged.

# Figure 8



Link: <https://www.animatedknots.com/figure-8-knot>

Photo credit: Animated Knots™

# Figure 8 Follow Through



Link: <https://www.animatedknots.com/figure-8-follow-through-loop-knot>

Photo credit: Animated Knots™



# Figure 8 on a Bight



Tied like a regular Figure 8, but on a bight of rope.

Photo credit: Animated Knots™

# Figure 8 Double Loop



Link: <https://www.animatedknots.com/figure-8-double-loop-knot>

Photo credit: Animated Knots™

# Bowline



Link: <https://www.animatedknots.com/bowline-knot>

Photo credit: Animated Knots™

# Alpine Butterfly



Link: <https://www.animatedknots.com/alpine-butterfly-loop-knot>

Photo credit: Animated Knots™

# Double Fisherman's Bend



Link: <https://www.animatedknots.com/double-fishermans-bend-knot>

Photo credit: Animated Knots™

# Prusik Knot



Link: <https://www.animatedknots.com/prusik-knot>

Photo credit: Animated Knots™

# Water Knot



Link: <https://www.animatedknots.com/water-knot>

Photo credit: Animated Knots™



# Tensionless Hitch





# Wrap 3, Pull 2

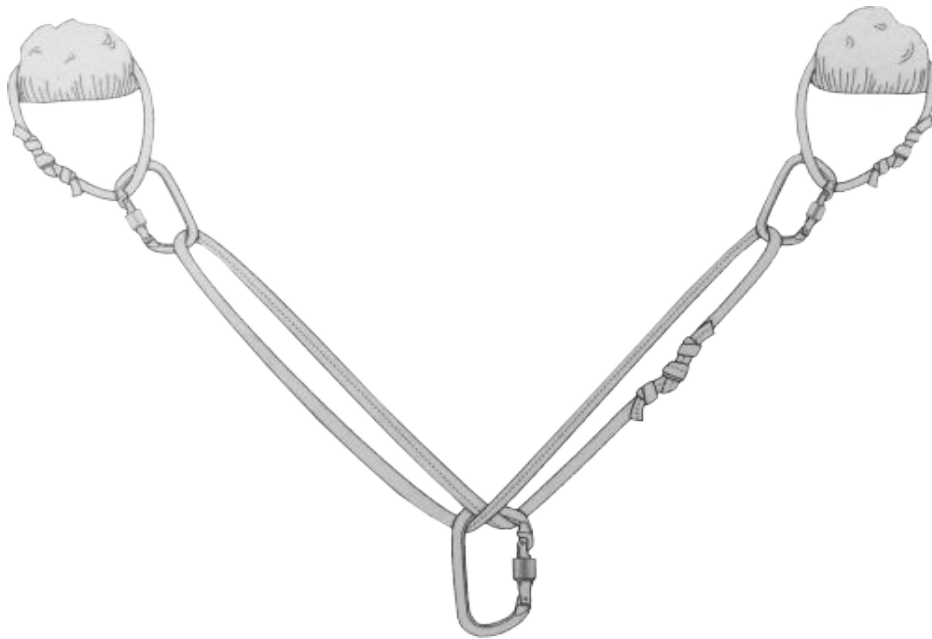




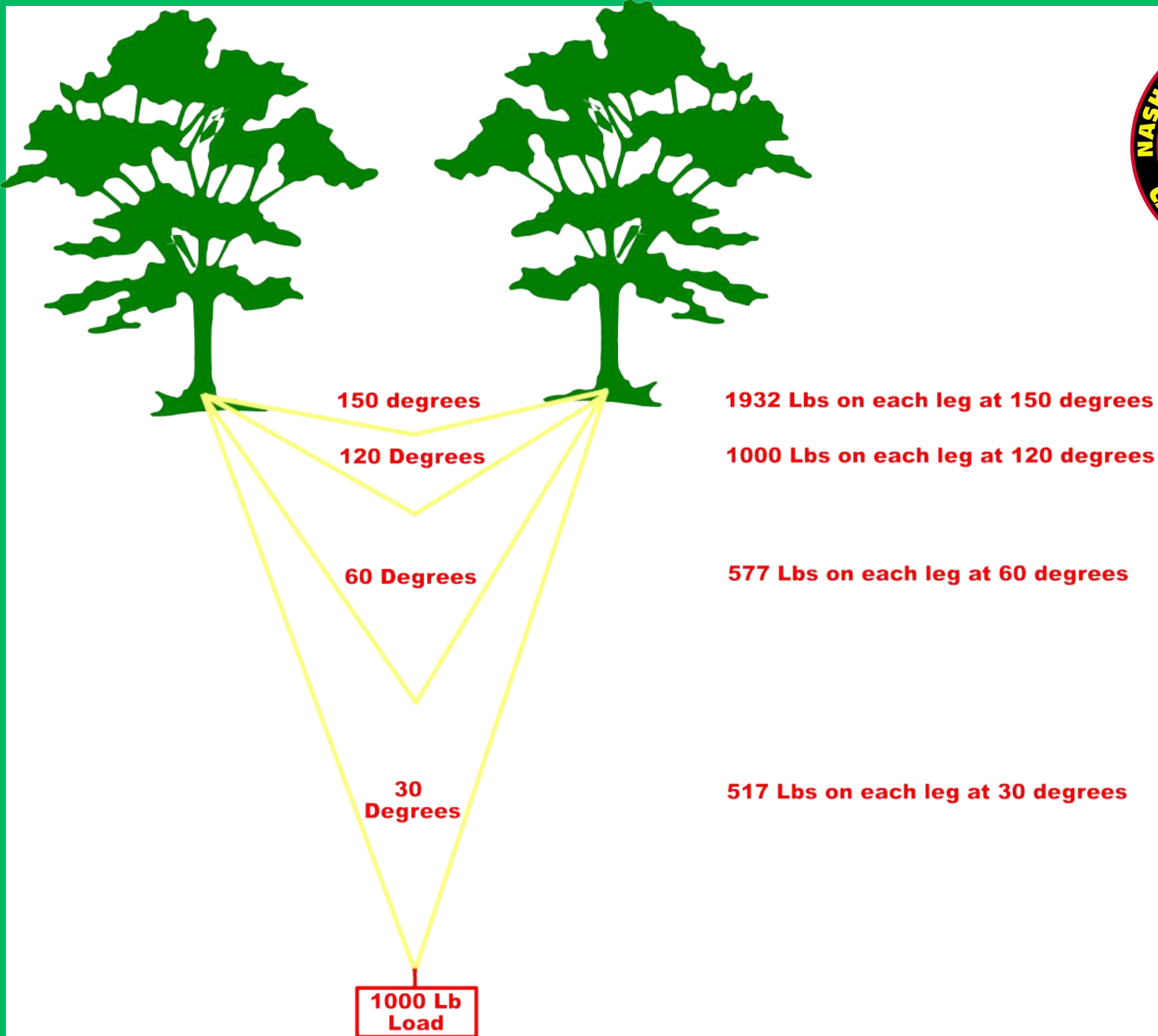
# Basket Hitch



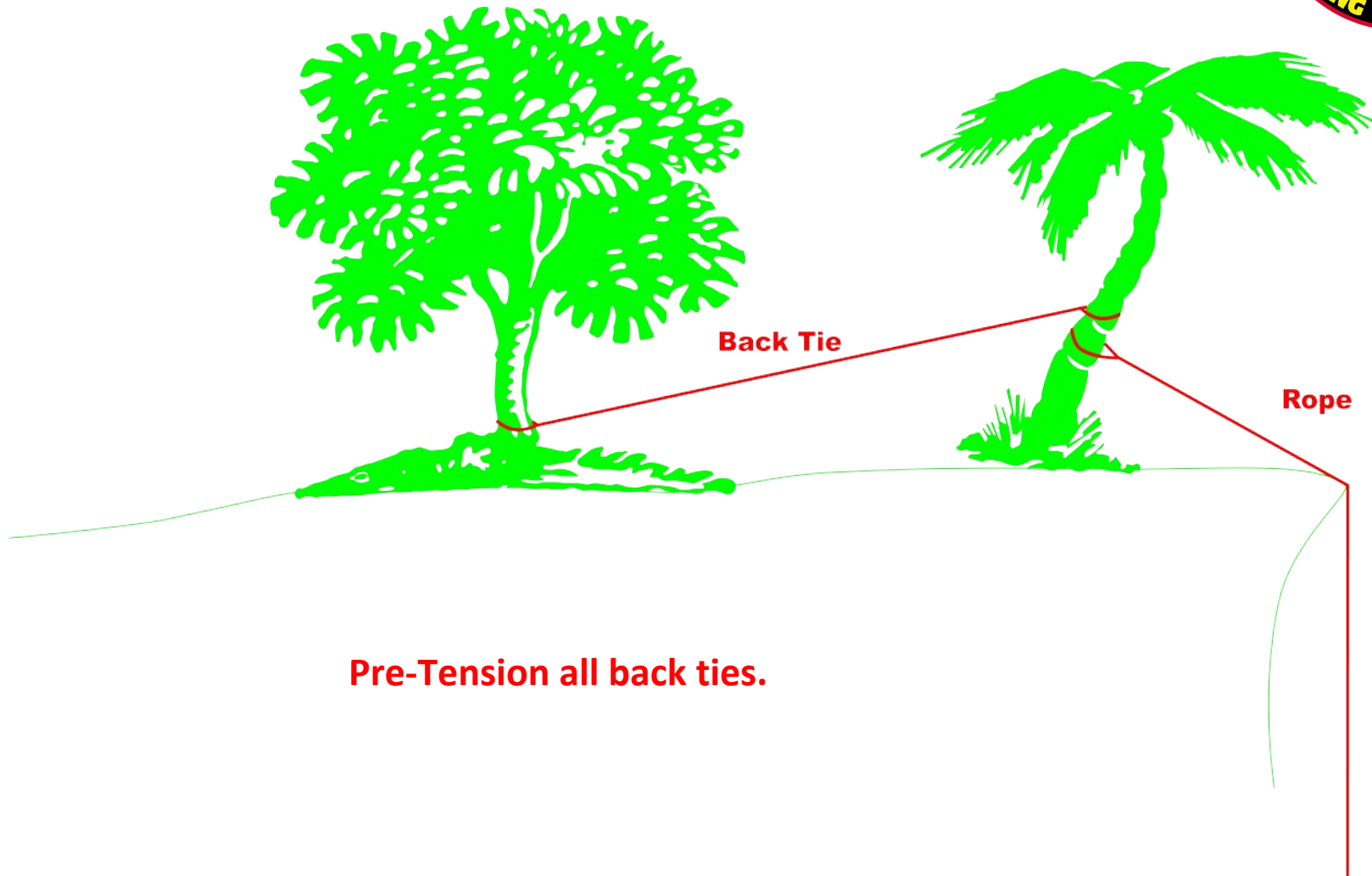
# Forces and Angles



**With a 1000-pound load, there is a force of 707 lbs. on each leg at 90 degrees.**



# Back Tying Anchors



**Pre-Tension all back ties.**