Knots & Their Uses

- a good knot holds but is easy to open if necessary
- there are different knots for different purposes and all knots are not good for all purposes
- practice makes perfect
- a good knot needs not to be complicated, use the simplest one good enough for the job
- there is a difference in situations where there is constant pull on the rope or if it is sometimes loose and sometimes taut
- sometimes it is important to be able to open the knot, even if there is a heavy load on the line
- learn the difference of the wrong way to do it and the right way to do it, especially how the wrong way to do it causes the knot to slip or makes it difficult to open

Mark Sutton Competition

Each member of the patrol may be asked to understand and use one knot from each of the Loops, Hitches and Bends sections and three knots from the Other Section, in an appropriate situation:

‘Loops’ (1)

Alpine Butterfly, Bowline, Double Figure of Eight

Hitches (1)

Truckers Hitch, Tautline Hitch, Timber Hitch

Bends (1)

Zeppelin Bend, Sheet Bend, Carrick Bend

Other (3)

Clove Hitch, Reef Knot, Fisherman’s Knot, Fireman’s Chair, Round Turn and Two Half Hitches, Sheet Bend, Sheep Shank

Alpine Butterfly

(also known as Lineman's Loop)

If, as A.P. Herbert wrote in a poem, "the bowline is the king of knots", then the Alpine Butterfly, added Scouting's ropework write John Sweet, must surely be the queen.

Good Points

- will take a load in any of the three directions (independently or together)
- easy to tie
- can be tied quickly
- can be tied without access to the ends of a rope

Bad Points

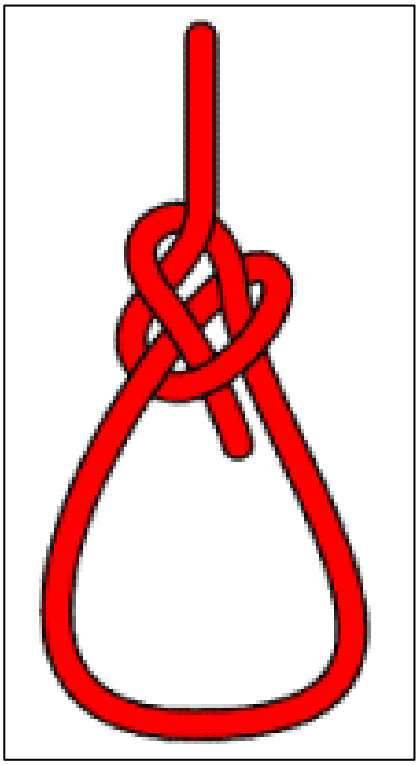
- not many!

Notes

- useful for making fixed loop footholds or handholds in a long rope
- can also be used to secure a bight in a line to a carabiner
- could be used for hoisting or lowering equipment where both ends of the line are attended to keep the load away from the face of a wall

Bowline

(pronounced “boh-linn”)



The most useful and one of the simplest ways of putting a fixed loop in the end of a rope. It is easy to tie and to untie, it never slips nor jams and has a high breaking strength. It has been called the 'King of Knots'

Good Points

- easy to tie and untie
- never slips nor jams
- has a high breaking strength
- it will not slip under load
- the more pressure applied, the stronger the knot
- easily untied

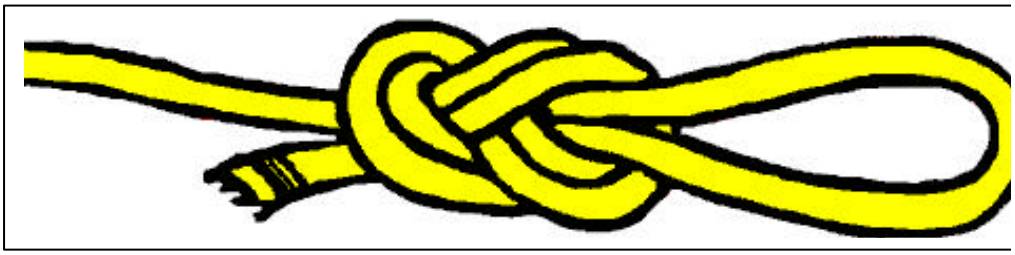
Bad Points

- cannot be tied or untied with a load on it
- though the Bowline isn’t generally bad, it isn’t secure enough for critical applications, especially where the line will see a lot of jerking and/or where stiff or slippery rope is used. If you tie a Bowline in polypropylene rope, and give it a few jerks, you’ll quickly discover its lack of security.

Notes

- if you use this knot to carry an injured person, you must use a stop knot
- you can use it for tying two ropes of different sized together with one knot on each line
- two bowlines can make an emergency bowswain's chair

Double Figure Eight



(also known as Figure Eight Loop)

This knot is favoured by climbers because its distinctive shape makes it easy to check.

Good Points

- easy to spot if tied incorrectly
- easily tied
- secure

Bad Points

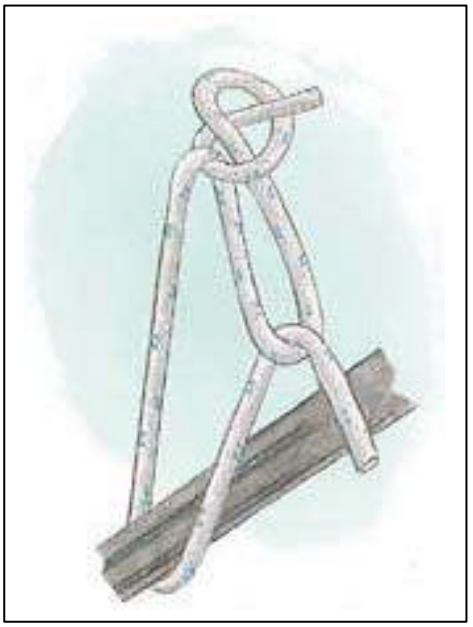
- cannot be tied with a load on it

Notes

- This is a very useful knot for climbing (e.g. attaching your safety rope to your harness) as you can see at a glance if the knot is tied correctly.
- A half hitch can be tied around the standing part to make the knot more secure

Trucker's Hitch

(also known as Waggoner's Hitch)



For lashing down loads this hitch is unrivalled.

Good Points

- acts as a lever

Bad Points

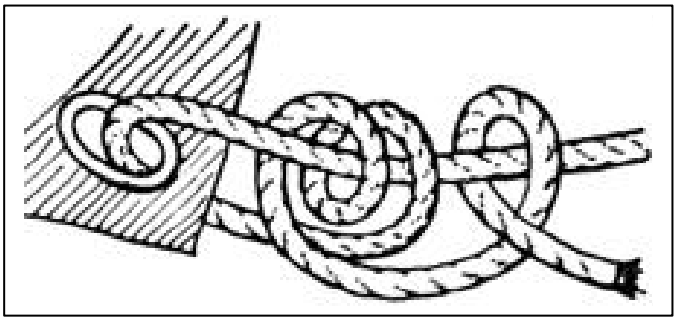
- only secure when under constant strain
- comes undone as soon as the strain is released
- can cause sever chafe on a rope if the knot is used repeatedly in the same place on the rope.

Notes

- can also be used as an emergency tackle (with care)
- pull down on the working end to tighten the knot and secure with one or two Half Hitches.

Tautline Hitch

(also known as Rolling Hitch)



Where a lengthwise pull from a pole or static line is needed, this old faithful takes some beating.

Good Points

- strain can be applied sideways to this knot in one direction
- can be tied around a pole/ring or for attaching a light line to a rope

Bad Points

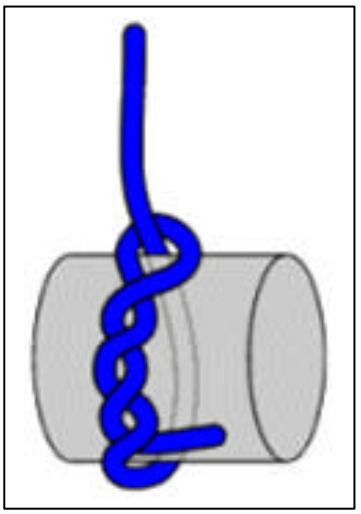
- can only cope with strain in one direction

Notes

- the two diagonal riding turns must go on the side of the object from which the pull will be applied

Timber Hitch

(a useful hitch to grip and pull)



Traditionally used for tying a length of rope around a pole or bundle of logs, the more strain that is put on the hitch the tighter it grips.

Good Points

- quick to tie
- never jams
- easy to untie

Bad Points

- only secure when under load

Notes

- used together with one or more Half Hitches (Killick Hitch) it can be used to drag or hoist a cylindrical object.

Zeppelin Bend
(also known as Rosendahl's Bend)

A close relative to this bend is the Hunter's Bend or Rigger's Bend.

Good Points

- strong and secure
- can be used in anything from heavyweight cables to smallest of cords
- can be used to join lengths of slippery synthetic rope
- stable knot
- easy to untie

Bad Points

- working ends stick out at right angles to the standing parts

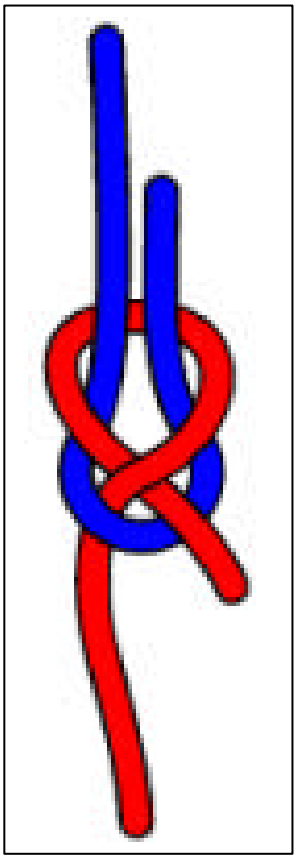
Notes

- this is actually just one of a family of bends comprising two interlocked overhand knots

The Hunter's Bend is probably the equal of the Zeppelin bend

Sheet Bend

(also known as Weavers Knot)



The sheet bend is very similar to the square knot, granny knot, thief knot, and particularly the bowline. In fact, the sheet bend can be tied using the One Handed Twist Method which is also used to tie the bowline.

Good Points

- very fast to tie
- when slipped, is one of the easiest bends to work with
- useful when joining two ropes of different diameters.
- it will not slip under load
- the more pressure applied, the stronger the knot
- easily untied

Bad Points

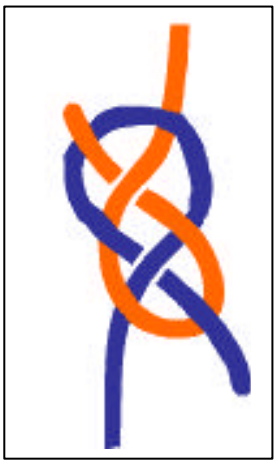
- it may jam
- hard to untie if wet and under strain (for instance in a towline)
- the knot is neither strong nor secure. It reduces the strength of lines by 55% and can spill if subject to spasmodic jerking

Notes

- if the ropes are of quite different diameters (e.g. a very large and a small rope together) then you will be better off tying a Double Sheet Bend.
- if you have done the knot correctly the two ends should be on the same side of the knot
- the running parts should be left long because there is some initial slip in the knot when the knot is first brought under tension

Carrick Bend

(good for large ropes or cables)



The Carrick Bend is mainly used for joining large diameter ropes or hawsers. It can also be formed into a decorative knot like a lanyard knot or a mat.

Good Points

- can be used on heavy cable or large ropes
- can be allowed to tighten and collapse on itself when strain is taken on the standing parts

Bad Points

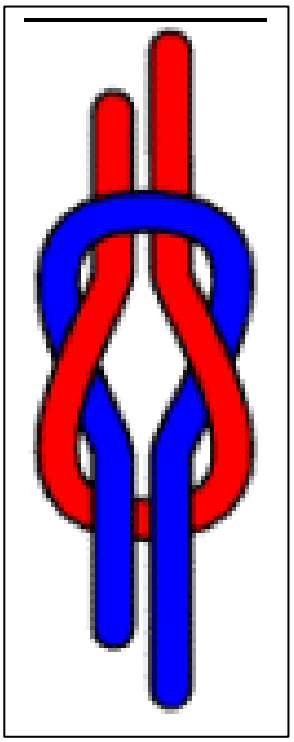
- reduces strength of rope to about 65 %

Notes

- sometimes seen with more than two half hitches either to make it more secure or to use up excess rope

Reef Knot

(also known as Square Knot)



The best known and most useful parcel knot. It should preferably only be tied with the two ends of the same material, but should never be used as a bend. It is the best knot for tying a triangular bandage.

WARNING: The reef knot should never be used as a bend to join two ropes that will be under load. The reef-knot is only useful in simple applications.

Good Points

- easily tied

Bad Points

- can slip
- can come undone under movement
- will capsize or jam under load

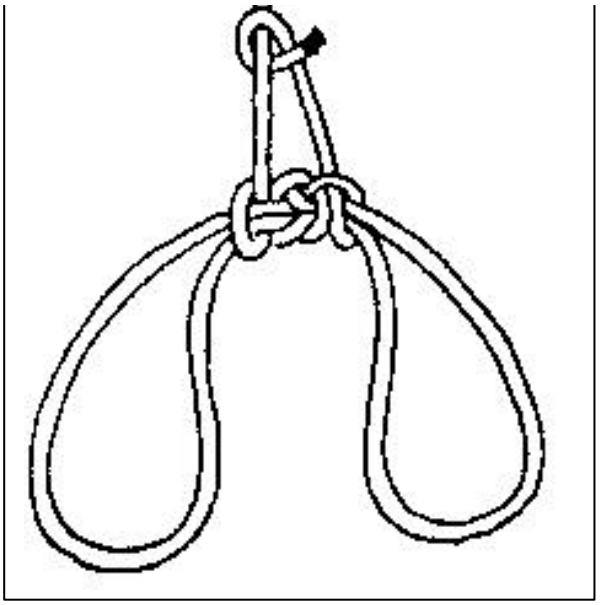
Notes

- its relatives, the granny, the thief-knot and the what-knot all have their purposes, but not as a trustful knot

it is strictly a binding knot, reliable only when pressed against something else and tied in both ends of the same material so restrict its use to bandages and all sorts of parcels.

Fireman's Chair

(a good rescue knot)



In the event of a proper harness not being available this knot can be used for light rescue.

Good Points

- quick to tie
- can be tied in the bight

Bad Points

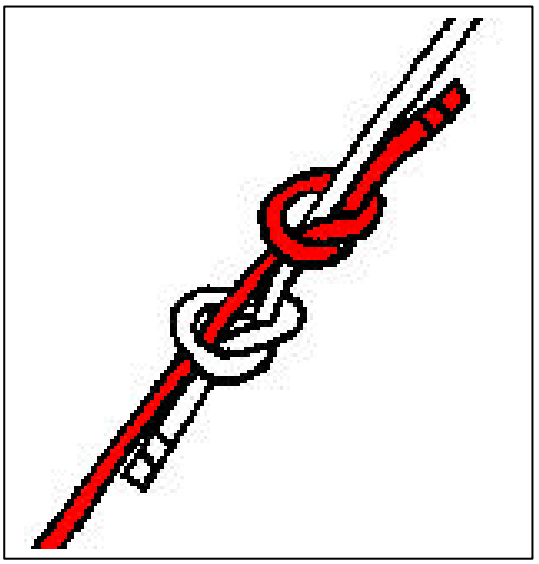
- not to be used for very heavy loads
- dangerous unless the loops are locked off

Notes

- one loop, adjusted for size, fits beneath the subject's armpits, with the other loop around behind the knees
- one rescuer lowers the person with one long end while a second rescuer pulls them away from the wall with the other rope

Fisherman's Knot

(good quick bend)



Not to be confused with the Fisherman's Bend (which is actually a hitch!).

Good Points

- safe and reliable
- simple and effective

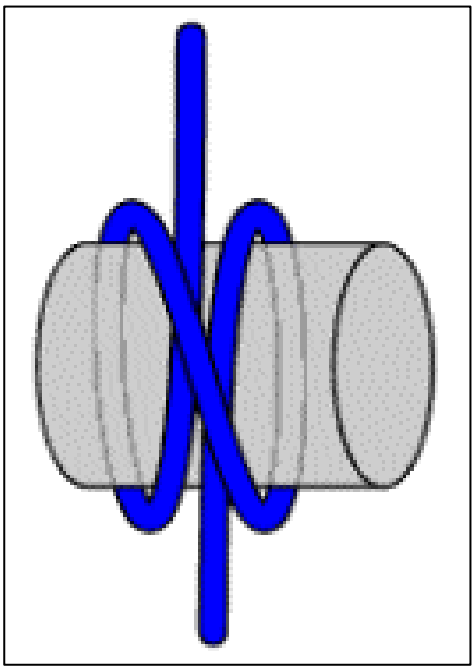
Bad Points

- like all knots will weaken the lines in which it is tied
- may not be able to untie it if you use anything but rope

Notes

- the ends can be taped down to prevent them working loose
- the short ends must be at least five times the diameter of the rope
- a double fisherman's knot can be used for more slippery or smaller diameter line

Clove Hitch
(general utility hitch)



The nearest there is to a general utility hitch. It is easy to tie in a number of different ways and to untie. It has a wide variety of uses but care should be taken not to misuse it: it is so easy to use it when a more suitable hitch (e.g. a Rolling Hitch etc.) would serve better.

Good Points

- quick and easy to tie
- can be tied in the bight
- can be tied one handed

Bad Points

- can slip in wet conditions or in slippery rope
- weak when a load is applied to it rapidly
- needs constant tension on both ends
- without extra support, it is untrustworthy in any situation, except as a crossing knot

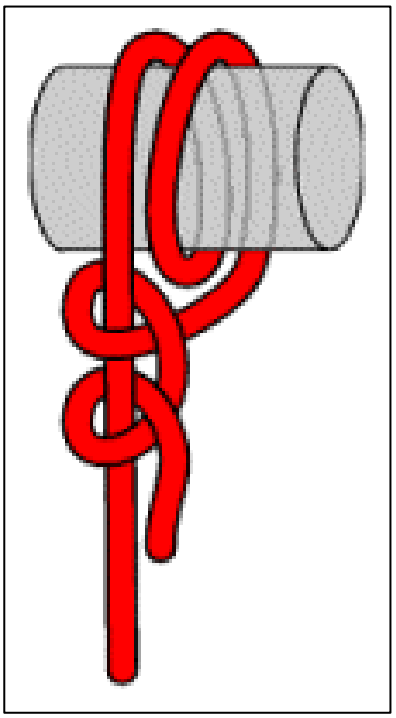
Notes

- if you have to use it, work it up properly; pull length-wise only at both ends before you load the working end
- the standing end should be secured if it is going to be used as an 'anchor' as it may work loose otherwise
- if you have to use it, work it up properly; pull length-wise only at both ends before you load the working end. It is better to use the Rolling Hitch instead

Although often used to start and finish lashings it is far from ideal for this task. Consider using another hitch instead or at least secure the standing part of the Clove Hitch used

Round Turn and Two Half Hitches

(good all round hitch)



This knot can be used to secure a rope in a variety of situations. It can be placed under a lot of strain and is easy to untie.

Good Points

- it rarely jams!
- a good hitch in almost all circumstances
- easy to untie even after being subjected to a large strain
- easy to tie even when the line is under tension

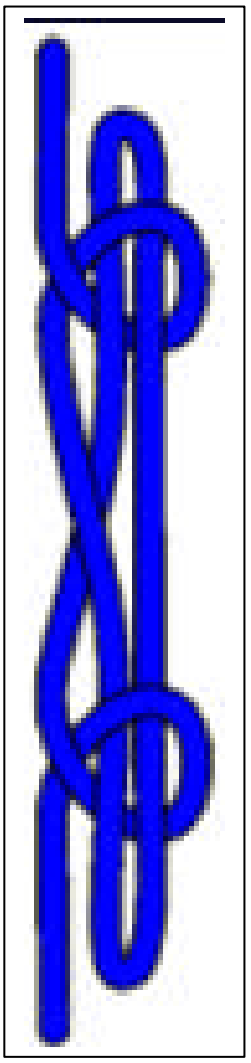
Bad Points

- not many!
- possible to work loose if subject to spasmodic motion

Notes

- sometimes seen with more than two half hitches either to make it more secure or to use up excess rope

Sheepshank



The sheepshank is designed to shorten a rope (without cutting it!). It can also be used to take up the slack in a rope.

Another very useful purpose it serves (that people often overlook) is its ability to protect a weak or damaged section of the knot. Simply ensure that the damaged section forms the middle line of the sheepshank. The strain will be taken at either end and very little (or no) strain will be placed on the weakened part.

Good Points

- can protect a weak portion of the rope
- easy to tie

Bad Points

- can come undone if ends are not subject to constant tension

Notes

- a damaged rope should always be replaced or retired from ‘active use’ and be used for knot tying practice only
- if both ends are available pass them through the ends to stop the sheepshank from coming undone when not under tension

It’s knot a problem!

Choose the most suitable knot for each problem from the following list

‘Loops’

- Alpine Butterfly
- Bowline
- Double Figure of Eight

Bends

- Zepplin Bend
- Sheet Bend
- Carrick Bend

Hitches

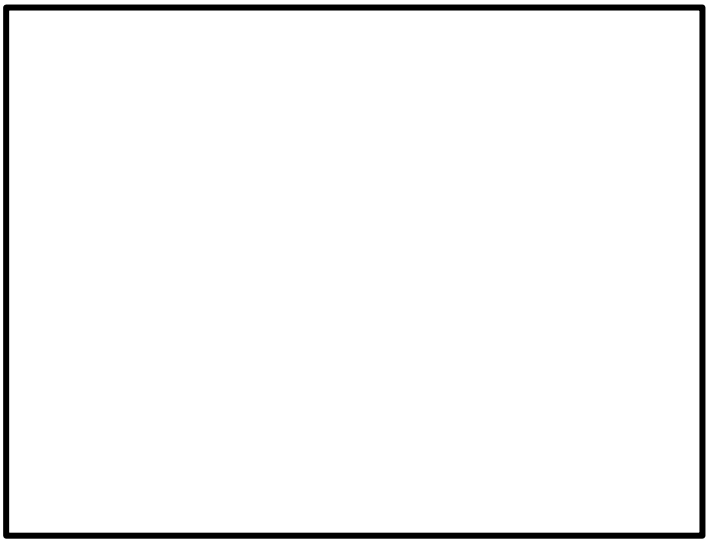
- Truckers Hitch
- Tautline Hitch
- Timber Hitch

Other

- Reef Knot
- Fisherman’s Knot
- Fireman’s Chair
- Round Turn and Two Half Hitches
- Sheet Bend
- Sheep Shank

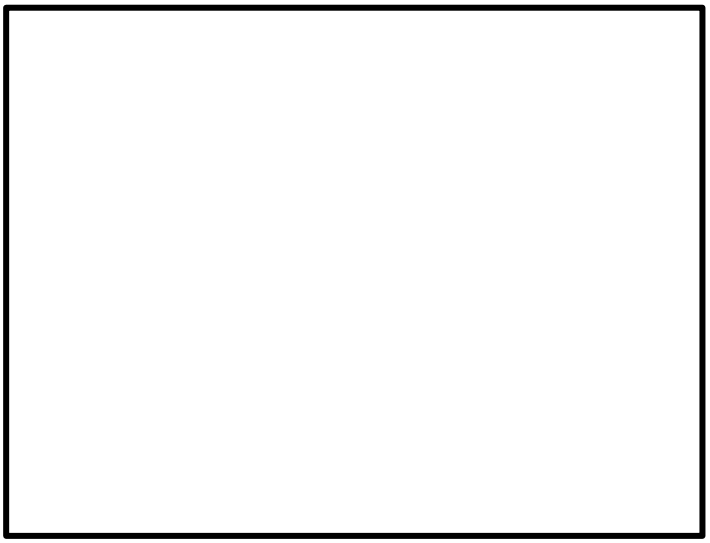
Problem 1

You are using a rope to drag a heavy load up a slope and wish to secure it to a pole at the top of the slope



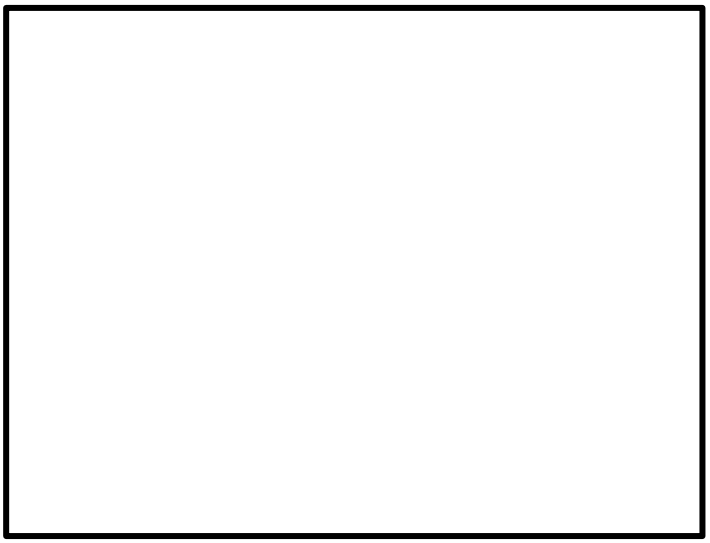
Problem 2

You want to use a knot to start a square lashing on two poles



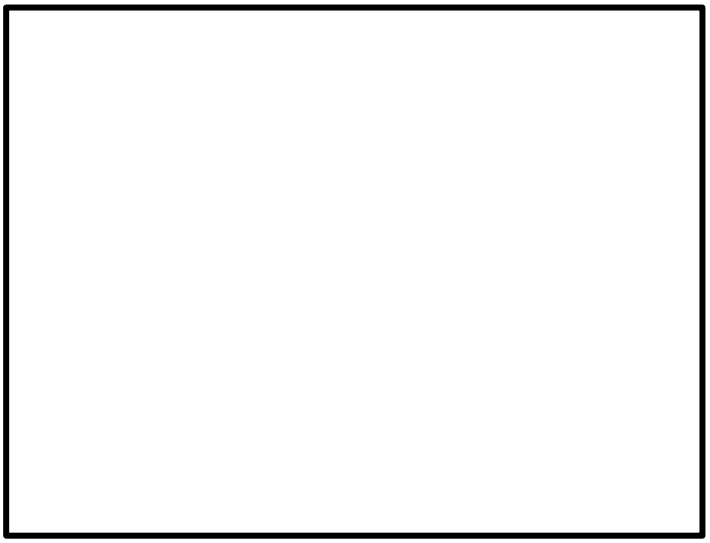
Problem 3

You have a rope with a damaged section in the middle and wish to avoid putting strain on the damaged section whilst still being able to ‘pull’ on the rope



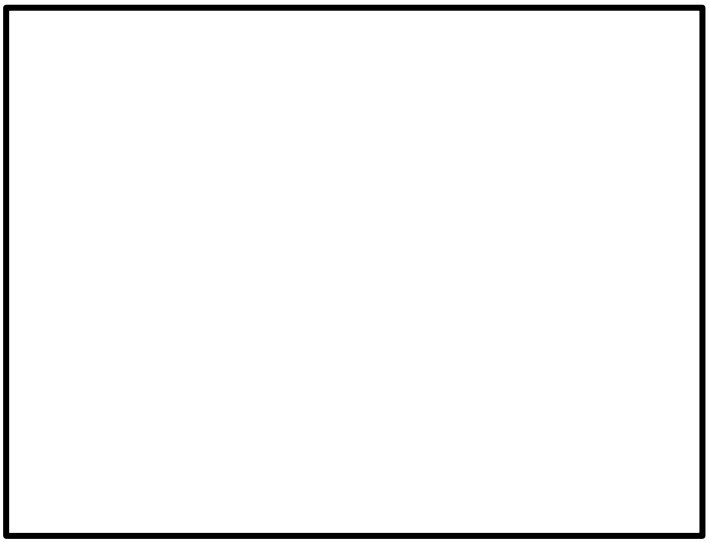
Problem 4

You have two lines that you wish to join together. They will be placed under a good deal of strain and may be jerked about quite a bit



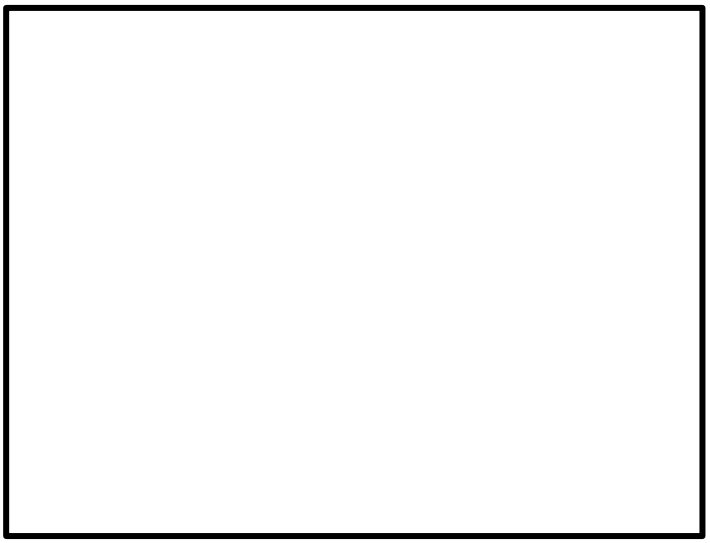
Problem 5

You need a knot that will tie a parcel. The knot will be lying flat against the parcel.



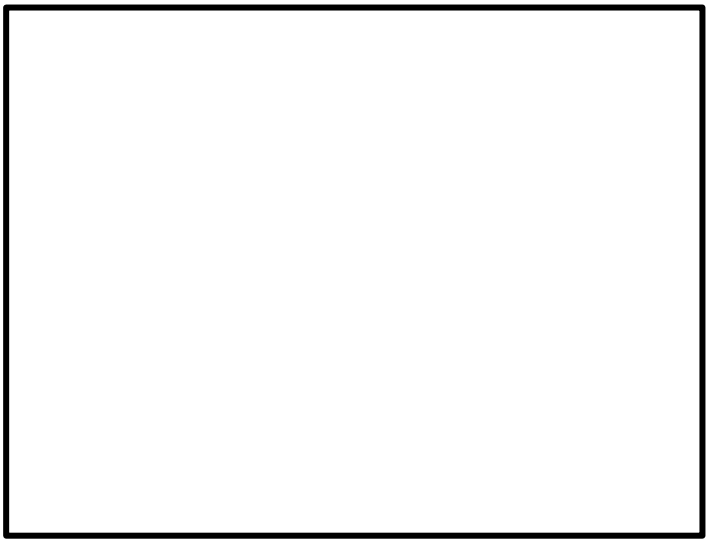
Problem 6

You have a rope with a great deal of slack that needs to be taken up. The ends will be under a constant tension.



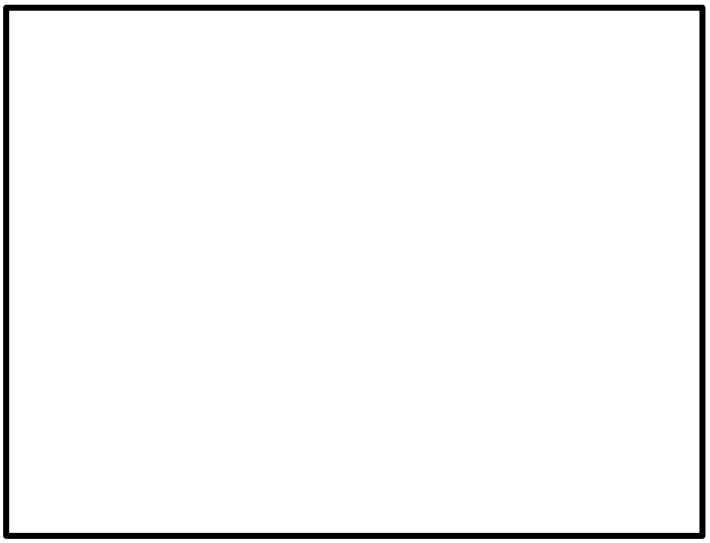
Problem 7

You need a fixed loop to lift someone from the bottom of a well in an emergency



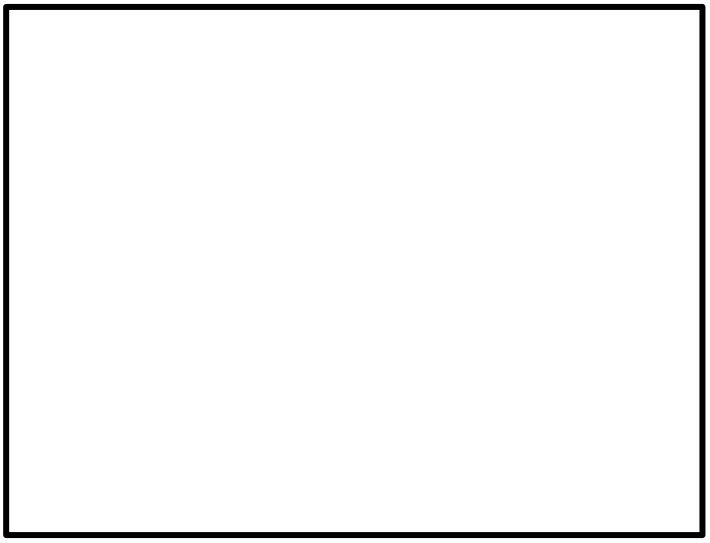
Problem 8

You have a roped off area around your campsite and wish to add another few upright poles to the middle of the rope. You need to tie the existing rope around the pole, you do not have access to the ends.



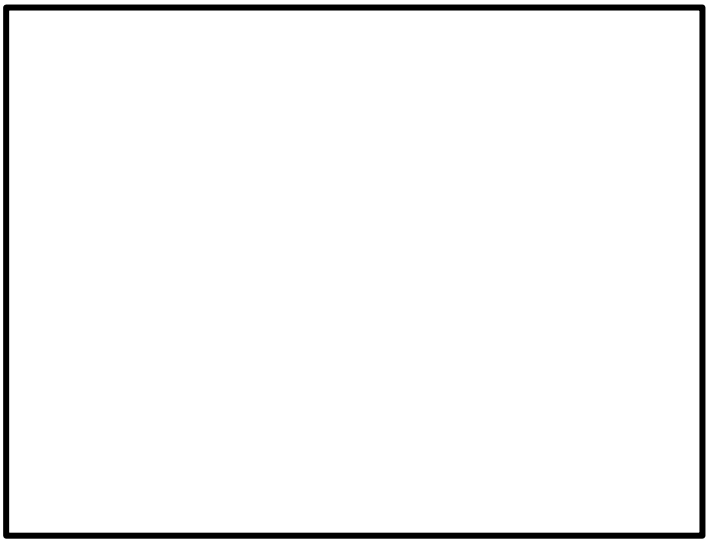
Problem 9

You need to tie a triangular bandage in a sling around a persons arm



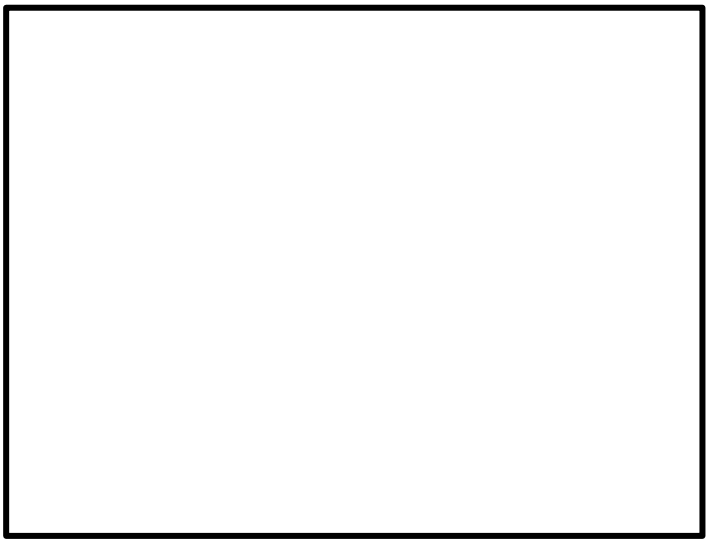
Problem 10

You need to heave a line across a river. You decide to throw a light line first and pull across a heavier line. You wish to join a thin rope to a heavier, thicker rope.



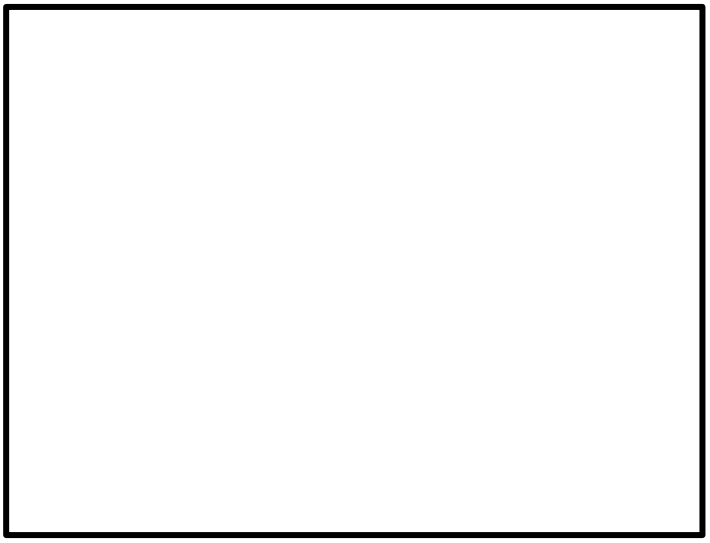
Problem 11

You wish to tie up your boat to a mooring post. The boat will be rocking up and down on the water.



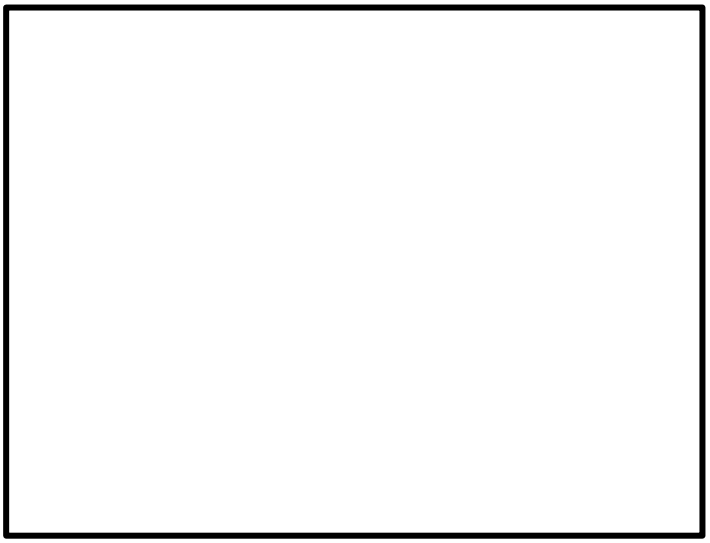
Problem 12

You need a fixed loop in the end of a rope so that you can quickly throw it over a towbar of a car.



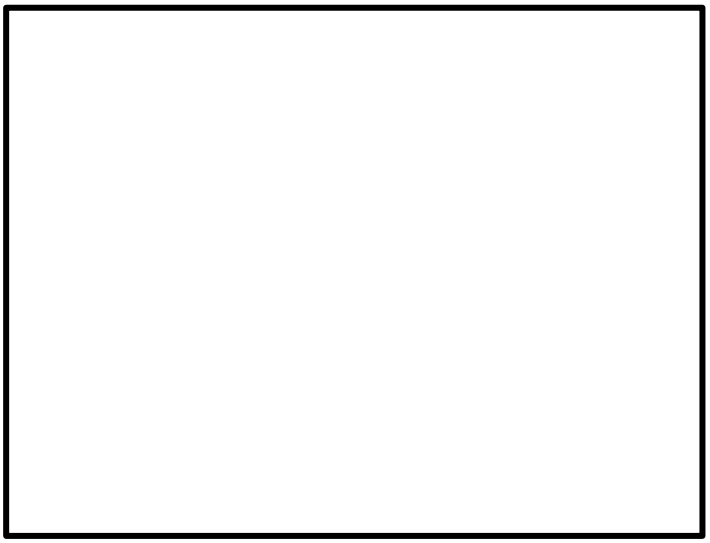
Problem 13

You have a long rope that you want to make into a simple ladder so you can climb up and down it with ease. You need some footholds and handholds.



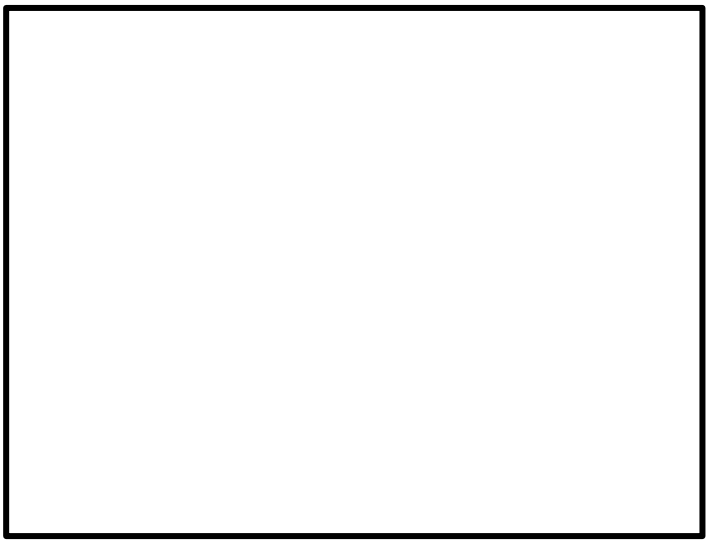
Problem 14

You want to attach a smaller line to a large diameter rope. The line will be under strain in one direction only and you don't want it to slip along the large rope.



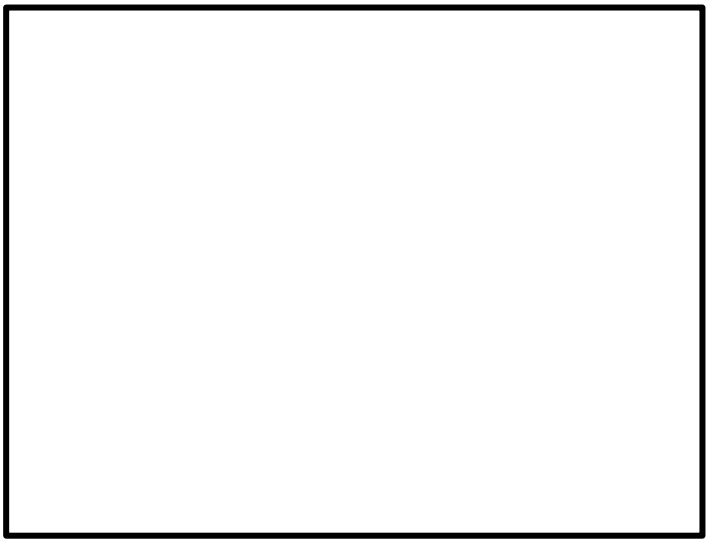
Problem 15

You want to attach a safety line to a carabiner and harness for use in climbing. You need a fixed loop that you can ensure it is tied correctly, even in poor light or poor weather.



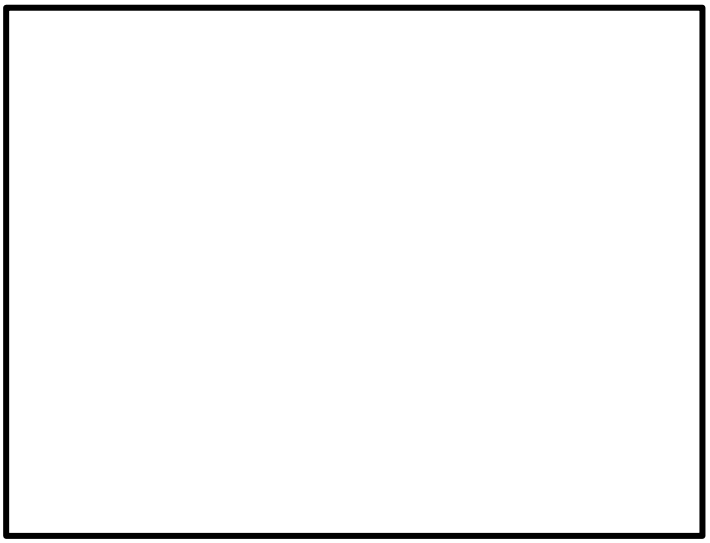
Problem 16

You have a load of camping gear in a trailer and a groundsheet thrown over the top. You need to secure the load down so it stays safely in the trailer during the trip to camp.



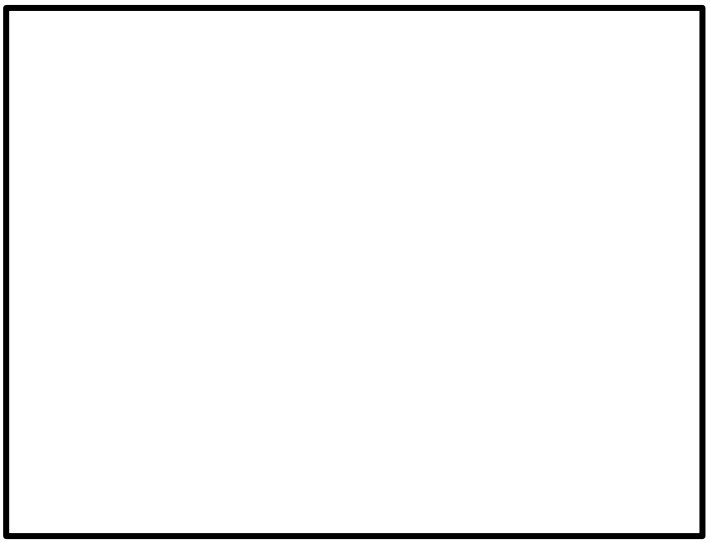
Problem 17

You want to tie your guylines to a tent peg. However you want to be able to adjust the tension of the line with ease as you think it may rain during the week.



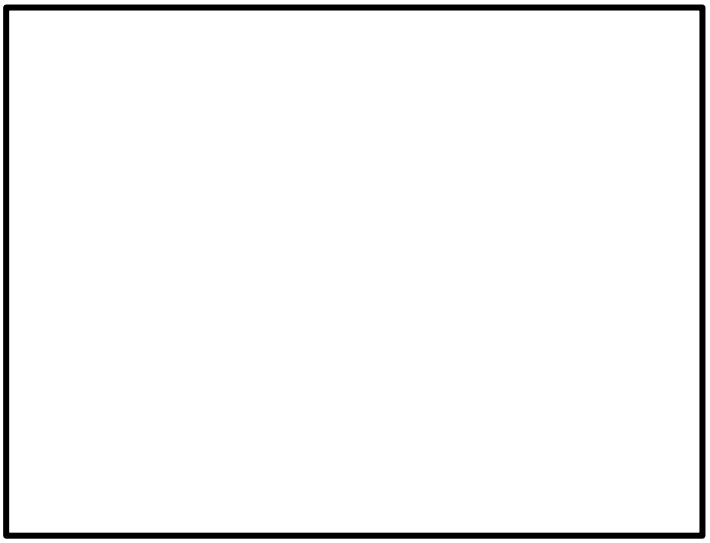
Problem 18

You have managed to find a large log that will be excellent for use on your campfire to get some nice embers for teatime. You need to drag the large heavy log back to camp.



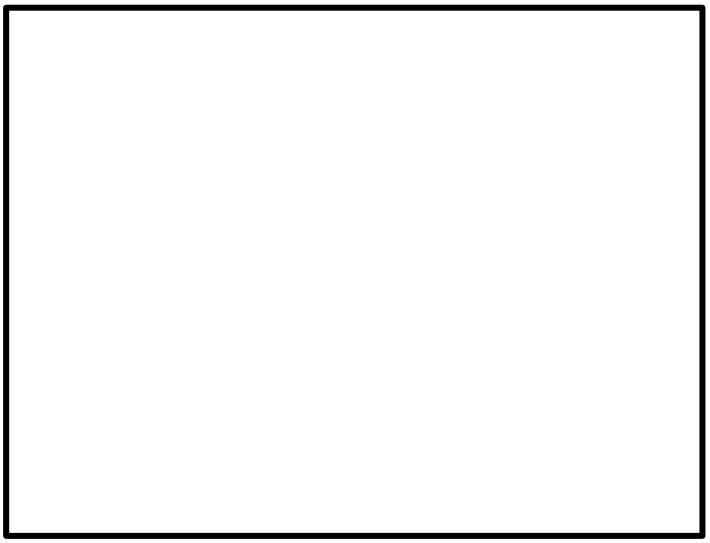
Problem 19

You have two huge, thick ropes that you wish to join together.



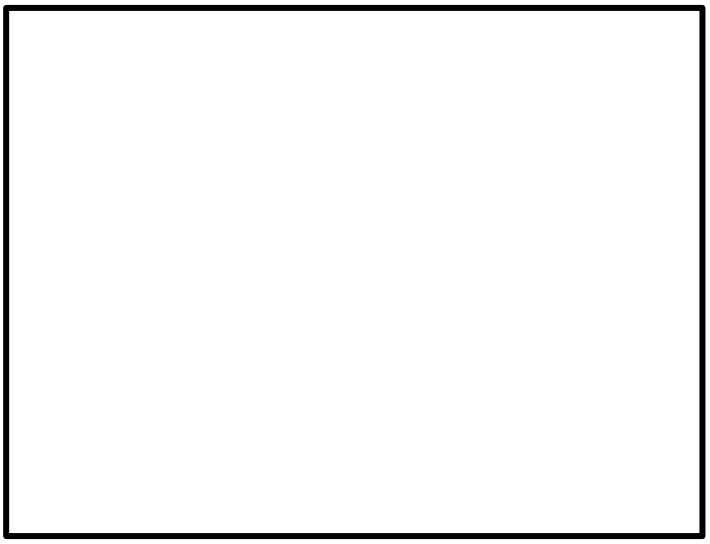
Problem 20

You need to lower an injured friend down a 4 m wall with the help of your patrol. You need a good rescue knot to lower him safely and to keep him away from the wall.



Problem 21

Can you think of a problem that you know you can solve with one of these knots that has not already been covered?



It's knot a problem! – now you know the answer!

Problem 1 – Round Turn and Two Half Hitches. If you can get the round turn around the pole the friction will hold most of the load for you. You can secure this by tying a clove hitch (two half hitches) around the rope. It's the friction that holds the line, the half hitches just stop it from coming undone.

Problem 2 – Most of you may say Clove Hitch. Yes, that is what you have been taught but it is not the best solution. You would be better off using a Round Turn and Two Half Hitches. A Clove Hitch is only secure if both ends are under tension and at right angles to the 'pole'. This means you need to secure the standing end of the Clove Hitch by wrapping it around the working end as you start your turns.

Problem 3 – Sheepshank. Make the damaged section the 'middle' of the sheepshank and when the ends are loaded the middle section should not take any undue strain. This is far from a perfect solution and should be considered temporary at best. It should also not be used in critical situations or where someone's safety is at stake.

Problem 4 – You may say Sheet Bend. Yes, perhaps. A better solution would be to tie two bowlines 'inside each other' so to speak. You make two interlocking loops. Remember a Sheet Bend will come undone if subject to jerking. You could also use a Carrick Bend or Fisherman's Knot. Perhaps the best solution would actually be a Zeppelin Bend.

Problem 5 – Reef Knot. As long as the knot lies against the parcel it should be reasonably secure. You must not use a Reef Knot as a Bend though.

Problem 6 – Sheepshank. Ideal for taking up slack.

Problem 7 – Bowline. To be sure in this situation you must secure the end by placing a half hitch around the bowline. (note you have to have a fixed loop… perhaps the Fireman's Chair doesn't fit the qualification here although it is more suitable for that type of use)

Problem 8 – Clove Hitch. You can tie this without having access to the ends of the rope. As long as both ends are being pulled this should be secure.

Problem 9 – Reef Knot. As long as the knot lies against the shoulder it should be reasonably secure. You must not use a Reef Knot as a Bend though.

Problem 10 – Sheet Bend. A Sheet Bend can be useful in joining lines of different diameters. If in doubt about security use a Double Sheet Bend. Although other bends may still be used if the ropes are not hugely different in diameter (Zeppelin or Carrick Bend)

Problem 11 – Round Turn and Two Half Hitches. Generally useful as a hitch this should hold against the spasmodic motion. Do more than two Half Hitches if you have the line spare.

Problem 12 – Bowline. Ideal for making a fixed loop. Care should be taken if it is going to be subject to great strain or if it is critical however. There are better and more secure loops.

Problem 13 – Alpine Butterfly. This can be used at regular intervals to make secure loops for foot and handholds. Practice making the loops the right size and at the right spacing.

Problem 14 – Tautline Hitch. Very useful for putting up with strain in one direction. The rope will not slip along the larger line.

Problem 15 – Double Figure Eight. This is a nice loop for this purpose as even a beginner can learn to tie it quickly and you can tell at a glance if it has been tied correctly.

Problem 16 – Trucker's Hitch. Perfect for tying down loads. Acts as a lever so you can put a lot of tension into the rope when using secured points as anchors.

Problem 17 – Tautline Hitch. If looped around the peg and tied on its self it can be adjusted up and down the line to change the tension (it will put up with strain in one direction keeping the line tight but may be slid down by hand to loosen the knot)

Problem 18 – Timber Hitch. Tied around the log and then using one or two Half Hitches further down the log you can drag the log while keeping it in line behind you (together these are known as a Killick Hitch)

Problem 19 – Carrick Bend. Ideal for large diameter ropes or cables.

Problem 20 – Fireman's Chair. This is better than a bowline. You can support the back (under the arms) and the legs (under the knees). More importantly the other line can be used to pull the injured person away from the wall or other hazards.