Shorter after 30

Domain (x) – Age	Process	Range (y) – centimeters shorter
n	0.06(n-30)	f(n)
35	0.06(35-30)	0.3 cm
42	0.06(42-30)	0.72 cm
57	0.06(57-30)	1.62 cm
61	0.06(61-30)	1.86 cm
83	0.06(83-30)	3.18 cm

I. This linear relationship is not proportional. Proportional relationships may be written in the form of $f(x) = kx$, where k is a constant.
Since this function is written $f(n) = 0.06n – 1.8$, this is not a proportional relationship. The graph of a proportional relationship is a line graph that passes through the origin. This graph is a line graph, but does not pass through the origin. Therefore, the relationship is not proportional.

Lightning and Thunder

Domain (x) – Time in seconds	Process	Range (y) – Distance in feet
n	1,110n	f(n)
2	1,110(2)	2,220 ft
5	1,110(5)	5,550 ft
11	1,110(11)	12,210 ft
16	1,110(16)	17,760 ft
19	1,110(19)	21,090 ft

II. Since one mile equals 5, 280 feet, we see that approximately 5 seconds will pass between the moment you see the lighting and the moment you hear the thunder. An exact answer would be found by dividing 5,280 feet by 1,110, for a result of 4.76 seconds, or about 4 ¾ seconds.

This linear relationship is proportional. Proportional relationships may be written in the form of $f(x) = kx$, where k is a constant.
Since this function is written $f(n) = 1,110n$, this is a proportional relationship with a constant (k) of 1,110. The graph of a proportional relationship is a line graph that passes through the origin. This graph is a line graph, and passes through the origin. Therefore, the relationship is proportional.

Velocity versus Stopping Distance – sample data

Domain (x) – Velocity in MPH	Process	Range (y) – Stopping distance in feet
n	3.48n - 20	f(n)
30	3.48(30) - 20	84.4 ft
50	3.48(50) - 20	154 ft
60	3.48(60) - 20	188.8 ft
70	3.48(70) - 20	223.6 ft
80	3.48(80) - 20	258.4 ft

III.

This linear relationship is not proportional. Proportional relationships may be written in the form of f(x) = kx, where k is a constant.

Since this function is written f(n) = 3.48n - 20, this is not a proportional relationship. The graph of a proportional relationship is a line graph that passes through the origin. This graph is a line graph, but does not pass through the origin. Therefore, the relationship is not proportional

Height vs. Recommended Weight

Domain (x) – Height in inches	Process	Range (y) – Recommended weight in pounds (lbs)
h	$\frac{11(h-40)}{2}$	f(h)
60 inches (5 feet)	$\frac{11(60-40)}{2}$	110 lbs.
64 inches	$\frac{11(64-40)}{2}$	132 lbs.
69 inches	$\frac{11(69-40)}{2}$	159.5 lbs.
72 inches (6 feet)	$\frac{11(72-40)}{2}$	176 lbs.
75 inches	$\frac{11(75-40)}{2}$	192.5 lbs.

IV.

This linear relationship is not proportional. Proportional relationships may be written in the form of f(x) = kx, where k is a constant.

Since this function is written f(n) = 5.5h - 20, this is not a proportional relationship. The graph of a proportional relationship is a line graph that passes through the origin. This graph is a line graph, but does not pass through the origin. Therefore, the relationship is not proportional