

## Linear equations (Intermediate UKMT)

These questions must be attempted ***without a calculator***

*Topics covered in the questions below may not necessarily be from the topic of the title.*

1. Four of these tiles may be put side by side so that they simultaneously spell two imperial units of length.

Which tile is left out?

A 

E
D

      B 

I
A

      C 

L
R

      D 

K
C

      E 

M
Y

2. The sum of two numbers is 2. The difference between them is 4. What is their product?

A -8                  B -3                  C 0                  D 3                  E 8

3. Granny has taken up deep-sea fishing! Last week, she caught a fish so big that she had to cut it into three pieces (head, body and tail) in order to weigh it. The tail weighed 9kg and the head weighed the same as the tail plus one third of the body. The body weighed as much as the head and tail together.

How much did the whole fish weigh?

A 18kg                  B 27kg                  C 54kg                  D 77kg                  E 84kg

4. A male punky fish has 9 stripes and a female punky fish has 8 stripes. I count 86 stripes on the fish in my tank.

What is the ratio of male fish to female fish?

A 2 : 3                  B 3 : 2                  C 4 : 1                  D 4 : 7                  E 7 : 4

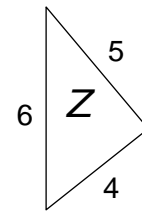
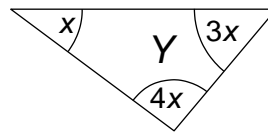
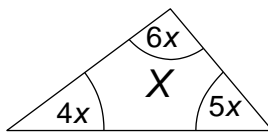
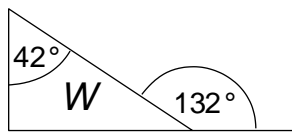
5. One of the digits 1 to 9 is put in each unshaded square so that no digit is repeated and the totals of the entries in the rows and columns are as shown.

What number goes in the starred square?

			Total	
				12
				7
		*		13
Total	4	16	12	

A 1                  B 3                  C 5                  D 7                  E 9

6. Which of the four triangles  $W$ ,  $X$ ,  $Y$ ,  $Z$  are right-angled?



- A only  $W$       B  $W$  and  $X$       C  $X$  and  $Z$       D  $Y$  and  $W$       E  $Y$  and  $Z$

7. Baldrick can afford to buy either 6 parsnips and 7 turnips or else 8 parsnips and 4 turnips. Both options leave him with no change whatsoever.

If, however, he bought only his beloved turnips, how many could he afford?

- A 11      B 12      C 13      D 16      E 25

8. Al, Bertie, Chris and Di have sums of money totalling £150. Al and Bertie have £55 between them and Al and Chris have £65 between them.

What is the difference between the amounts that Al and Di have?

- A £25      B £30      C £35      D £40      E £45

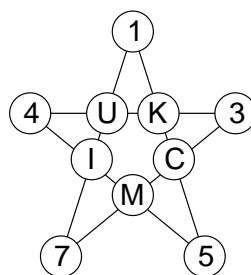
9. If  $C^\circ$  Celsius is the same temperature as  $F^\circ$  Fahrenheit, then  $F = \left(\frac{9}{5}\right)C + 32$ . To avoid working with fractions and awkward numbers, some people use the approximate formula  $F = 2C + 30$ .

What is the temperature in degrees Celsius when the approximate formula gives an answer which is too large by 1?

- A 5      B 9      C 10      D 12      E 15

10. In the star shown here the sum of the four numbers in any "line" is the same for each of the five "lines". The five missing numbers are 9, 10, 11, 12 and 13.

Which number is represented by  $K$ ?



- A 9      B 10      C 11      D 12      E 13