1.

Kyle is shopping for some gravel for his garden.
He sees two adverts.

Gardenbase
10 kg bag for £3.50
25 kg bag for £8
£5 off when you spend over £25

Harmison's Garden Supplies
Gravel sold at 40p per kilogram
Sale: 20% off

Kyle needs 65 kilograms of gravel.
Which shop is cheaper?

Gardenbase

$2 \times 25kg$ bags $= £16$

$2 \times 10kg$ bags $= £7$

$£23$

Harmison's

$40p \times 65 = £26$

$20\% \text{ of } £26 = £5.20$

$26 - 5.20 = £20.80$

Harmison's is cheaper.

$$\begin{array}{r} 65 \\ 40 \\ \hline 60 \\ 2600 \\ \hline 2600 \end{array}$$

(4)

2.
A dodecagon is a 12-sided polygon.

Find the interior and exterior angles of a regular dodecagon.

exterior angle $= 360 \div 12 = \underline{30°}$

interior angle $= 180 - 30 = \underline{150°}$

(2)

3.
Make y the subject of the equation

$$x - xy = y + 2$$

$x - 2 = y + xy$

$x - 2 = y(1 + x)$

$\dfrac{x-2}{1+x} = y$

(3)

4.

A football team played 46 matches last season.
They receive 3 points for each win, 1 point for each draw and no points for each loss.
The team lost 12 games last season and finished with 70 points.
How many games did the team win last season?

d = games drawn, w = games won

$$w + d = 34$$
$$- \quad 3w + d = 70$$
$$\overline{\qquad 2w = 36 \qquad}$$
$$w = 18$$
$$d = 34 - 18 = 16$$

16 draws

(5)

5.

r and s are functions.

$$r(x) = ax^2 \qquad\qquad s(x) = bx + 1$$

Given that rs(1) = 32 and s⁻¹(10) = 3, find a and b.

Find $s^{-1}(x)$:

$$y = 6x + 1$$
$$y - 1 = 6x$$
$$\frac{y-1}{6} = x$$

$$s^{-1}(x) = \frac{x-1}{6}$$

$$3 = \frac{10-1}{6}$$

$$6 = 3$$

$$s(x) = 3x + 1$$

$$s(1) = 3 + 1 = 4$$
$$r(4) = a \times 4^2$$
$$= 16a$$
$$32 = 16a$$
$$a = 2$$

$$a = 2$$
$$b = 3$$

(6)