

SEPTEMBER 2018 FOUNDATION PLUS TIER SOLUTIONS

1st/2nd

(a) $x \leq 3$

(b) $4x - 2 > 2x - 7$
 $2x - 2 > -7$
 $2x > -5$
 $x > -\frac{5}{2}$

(c) -2, -1, 0, 1, 2, 3

3rd

$$r = \frac{3m^2 - 5}{n}$$

$$rn = 3m^2 - 5$$

$$rn + 5 = 3m^2$$

$$\frac{rn + 5}{3} = m^2$$

$$\pm \sqrt{\frac{rn + 5}{3}} = m$$

4th

Circumference of wheel = $\pi \times 0.68 = 2.136\text{m}$

Number of revolutions = $10000 \div 2.136 = 4681$ complete revolutions

5th

(a) 2 or 5 (b) 2 or 5 or 10 (c) 27 (d) 10 (e) 64

6th

$\frac{1}{2} \times 16 \times \text{height} = 76$

$16 \times \text{height} = 152$

Height = 9.5cm

7th

(a) $5(3x - 2) = 2x + 3$
 $15x - 10 = 2x + 3$
 $13x - 10 = 3$
 $13x = 13$
 $x = 1$

(b) $7x^2 - 13 = 99$
 $7x^2 = 112$
 $x^2 = 16$
 $x = \pm 4$

(c) $x^2 + 9x - 36 = 0$
 $(x + 12)(x - 3) = 0$
 $x = -12, x = 3$

8th/9th

Cost of 1 roll: 4 roll pack = $\pounds 1.89 \div 4 = 47.25\text{p}$

9 roll pack = $\pounds 3.99 \div 9 = 44.33\text{p}$

9 roll pack is better value – cheaper per roll

10th

(a) $\pounds 250 \times 1.23 = \pounds 307.50$

(b) $\pounds 400 \times 0.81 = \pounds 324$

(c) $\frac{23}{40} \times 100 = 57.5\%$

11th

(a) $5\frac{2}{3} - 2\frac{3}{4}$
 $\frac{17}{3} - \frac{11}{4}$

(b) $2\frac{2}{5} \div 1\frac{2}{9}$
 $\frac{12}{5} \div \frac{11}{9}$

$$\frac{68}{12} - \frac{33}{12} = 2\frac{11}{12}$$

$$\frac{12}{5} \times \frac{9}{11} = 1\frac{53}{55}$$

12th

(a) $0.000907 = 9.07 \times 10^{-4}$ (b) $5.821 \times 10^3 = 5821$

(c) $\frac{(4.1 \times 10^{-2}) \times (3.8 \times 10^4)}{9.11 \times 10^{-2}} = 17102.08562 = 17100$ to 3 s.f.

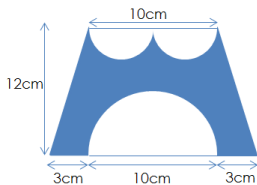
13th

(a) 50000 (b) 2.95 (c) 0.080 (d) 150000

14th

(a) 31, 35, 39 (b) $4n + 7$ (c) $4n + 7 = 137$
 $4n = 130$
 $n = 32.5$
 n must be an integer so 137 is not in the sequence

15th/16th



Area of trapezium = $\frac{1}{2} \times 12 \times (16 + 10) = 156\text{cm}^2$
Area of semi-circles = $(\pi \times 2.5^2) + \frac{1}{2} (\pi \times 5^2) = 18.75\pi$
Shaded area = $156 - 18.75\pi = 97.10\text{cm}^2$ (4 s.f.)

17th

$5x - 3y = 26$ (1) $3x + 4y = 4$ (2)
(1) $\times 3$ $15x - 9y = 78$ (3)
(2) $\times 5$ $15x + 20y = 20$ (4)
(4)-(3) $29y = -58$ $y = -2$
Sub $y = -2$ into (2)
 $3x - 8 = 4$ $3x = 12$ $x = 4$

18th

Missing angle = $360 - 90 - 90 - 66 = 114^\circ$ so Jane is not correct

19th

(a) $30a^3b$ (b) $8x(3x - 1)$ (c) $x^2 + 2x - 63$

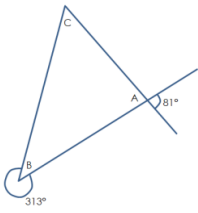
20th

$P(\text{both red}) = \frac{3}{6} \times \frac{3}{6} = \frac{9}{36} (= \frac{1}{4})$

21st

Dimensions of rectangle are x and $x + 5$ Perimeter = $4x + 10$
Dimensions of triangle is $2x$ Perimeter = $6x$
 $4x + 10 = 6x$ $10 = 2x$ $x = 2\text{cm}$ Rectangle area = $2 \times 7 = 14\text{cm}^2$.

22nd/23rd



$A = 81^\circ$ Vertically opposite angles are equal
 $B = 47^\circ$ Angles at a point add up to 360°
 $C = 180 - 81 - 47 = 52^\circ$ Three internal angles of a triangle add to 180° .

24th

- (a) $400 \times 22 = 8800 \div 50 = 176$ 50 peso notes
(b) $1105 \div 19.5 = \pounds 56.67$

25th

Granary = 20% of 160 loaves = 32 loaves
White = $\pounds 74.80 \div \pounds 1.10 = 68$ loaves
Wholemeal = $160 - 32 - 68 = 60$ loaves
Total = $(\pounds 1.20 \times 32) + \pounds 74.80 + (\pounds 1.15 \times 60) = \pounds 182.20$

26th

3 parts = $\pounds 132 = \pounds 44$
Adam = $7 \times \pounds 44 = \pounds 308$ Belinda = $3 \times \pounds 44 = \pounds 132$ Chris = $6 \times \pounds 44 = \pounds 264$

27th

- (a) Reciprocal of 6.25 = $\frac{1}{6.25} = \frac{4}{25}$ (0.16)
(b) $\frac{12.2 - \sqrt{33.6}}{\sqrt{42} - 4.1} = 2.689687838 = 2.69$ to 3 s.f.

28th

Volume = $12 \times 15 \times 18 = 3240 \text{cm}^3$
Mass = $3240 \times 12.4 = 40176 \text{g} = 40.176 \text{kg}$

29th/30th

Area = $\frac{1}{4} \times \pi \times 6.4^2 = \frac{256}{25} \pi \text{ m}^2$
Bags needed = $\frac{256}{25} \pi \div 2.5 = 12.9 = 13$ bags
Cost Before VAT = $13 \times 6.99 = \pounds 90.87$
After Discount = $\pounds 90.87 \times 0.85 = \pounds 77.24$
Including VAT = $\pounds 77.24 \times 1.2 = \pounds 92.69$