

Paper 1 June 2022

1) The straight line is
 $y = x - 6$

$$4) \frac{0.28}{0.8} = \frac{14}{40} \\ = \frac{7}{20}$$

$$3) 240 + 7.5\% = 240 \times 1.075$$

4) Congruency is RHS
 right angle, hypotenuse, side

$$5) \frac{80\ 000\ 000}{200} \\ = 400\ 000 \\ = 4 \times 10^5$$

$$6a) \frac{3^{12}}{3^7} = 3^5 \\ = 27 \times 9 \\ = 243$$

$$b) 8 \times 2^6 \times 2^4 \\ = 2^3 \times 2^6 \times 2^4 \\ = 2^{13}$$

7) Joel
 draws



Criticism $10 + 25 + 16 + 48$
 $= 99$ students
 not 98 students.

Criticism No labels

$$8) a) \text{Basic hourly rate} = \frac{450}{30} \\ = \text{£}15/\text{hour}$$

$$b) \text{overtime rate} = \frac{250}{10} \\ = \text{£}25/\text{hour}$$

$$9a) \frac{3}{5} \times \frac{1}{2} = \frac{3}{10}$$

$$b) 0.2 \times 0.3 = 0.06$$

10) Show constructions
 to bisect $\angle ABC$

$$11) \text{Area P} = \frac{3}{4} \times \pi 20^2$$

$$\text{Area Q} = \frac{1}{3} \times \pi 15^2$$

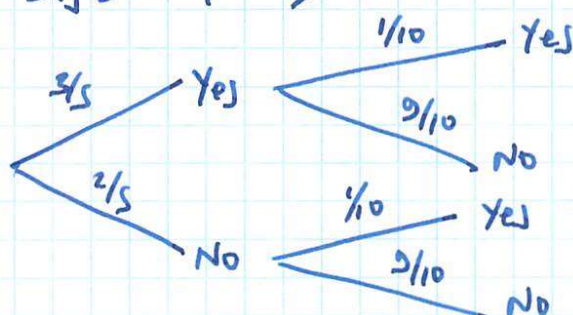
$$\frac{P}{Q} = \frac{\frac{3}{4} 20^2}{\frac{1}{3} 15^2}$$

$$= \frac{3600}{900} \\ = 4$$

$$12) \begin{array}{cc} \text{Yes} & \text{No} \end{array}$$

$$\text{Bag A} \quad 3 \quad 2$$

$$\text{Bag B} \quad 1 \quad 9$$



$$P(\text{Yes AND Yes}) = \frac{3}{5} \times \frac{1}{10} \\ = \frac{3}{50}$$

Expectation = Probability $\times$ Trials

$$= \frac{3}{50} \times 450$$

$$= 27$$

$$13) \frac{20}{15} = \frac{4}{3}$$

$$10 = \frac{15 \times 4}{2 \times 5}$$

$$= 6$$

17) 15 workers can complete a job in 8 days

So the job requires 120 worker-days

Now 120 worker days $\div$ 6 days

= 20 workers.

So an extra 5 workers required

15) The prism has 5 "sides" then it has 7 sides total (5 plus the 2 ends)
So formula is $n+2$

16) $y = x^2 - 4$ is graph A

11) Age 40 reads 3
Age 50 reads 13
Age 60 reads 30
Age 70 reads 66

People in 60s estimate 36
People in 50s estimate 17
so nwl is correct.

18) $12x^3 + 7x^2 + 3x - 10$
 $= 2(ax^3 + x^2 + 2x - 5) + x(bx + c)$

equate powers of x .

x^3 : $12 = 2a$ $a = 6$

x^2 : $7 = 2 + b$ $b = 5$

x : $3 = 4 + c$ $c = -1$

19) a) x y xy xy^2 x^2y^3
5th term is x^4y^3

b) x^6y^5 x^7y^8 x^8y^{13}
+ve -ve either
 x y $\checkmark$

because x^8 is always positive
 y^{13} must be negative
so y is negative

20) $y = \frac{5x+9}{x}$

$xy - 5x = 9$

$x(y-5) = 9$
 $x = \frac{9}{y-5}$

21) $\vec{EH} = 3a + b + a + 6b$
 $= 4a + 7b$

$\vec{FG} = 8a + 14b$

$\vec{GF} = -8a - 14b$

$\vec{EF} = \vec{EG} + \vec{GF}$

$= 2a + 15b - 8a - 14b$
 $= -6a + b$

$\vec{FE} = 6a - b$

22) $0.6888\ldots -$
 0.4555
 $\hline u = 0.2333$

let $10a = 2.333\ldots$
 $a = 0.233\ldots$
 $\hline 2.1$

$a = \frac{2.1}{9}$
 $= \frac{21}{90}$

23) $x=3$ is vertical
dotted shade to right
 $y=1$ is horizontal
dotted shade above
 $x+y=7$
is diagonal from $(7,0)$ to $(0,7)$
solid line shade underneath.

$$24a) \quad \frac{6}{a} - \frac{4}{4a} = \frac{24-4}{4a} \\ = \frac{20}{4a}$$

$$b) \quad (y^2-3y) \times \frac{y^2+10y+21}{y^2-9}$$

$$= \frac{y(y-3)(y^2+10y+21)}{(y+3)(y-3)}$$

$$= \frac{y(y-3)(y+3)(y+7)}{(y+3)(y-3)}$$

$$= y(y+7)$$

$$= y^2+7y$$

The trick here
is to
factorise.

25) a) acceleration is 0
(constant velocity)

b) distance is area under
graph

$$= \frac{1}{2}(10 \times 20) + (30 \times 20) \\ + \frac{1}{2}(10 \times 20)$$

$$= 100 + 600 + 100$$

$$= 800m$$

26) for 2v to win in next two
turns

$$P(\text{three}) = \frac{1}{6} \text{ and she wins}$$

$$P(2 \text{ then } 1) = \frac{1}{6} \times \frac{1}{6}$$

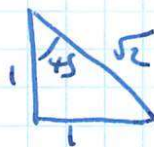
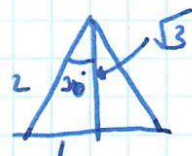
$$P(1 \text{ then } 2) = \frac{1}{6} \times \frac{1}{6}$$

$$\text{Total probability} = \frac{1}{6} + \frac{1}{36} + \frac{1}{36} \\ = \frac{4}{18} \\ = \frac{2}{9}$$

$$27) \quad y = -f(x)$$

This will be a reflection in the
 x -axis.

28)



$$(\cos 30^\circ \times \sin 45^\circ + \tan 60^\circ)^2$$

$$= \left(\frac{\sqrt{3}}{2} \times \frac{1}{\sqrt{2}} \times \sqrt{3} \right)^2$$

$$= \left(\frac{3 \times 1}{2\sqrt{2}} \right)^2$$

$$= \frac{9}{8}$$

$$= 1.125$$