CREDIT 2004 – Paper I

1. $6.2 - (4.53 - 1.1)$

$6.2 - 3.43$

2.77

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2. $\frac{2}{5}$ of $3\frac{1}{2} + \frac{4}{5}$ BODMAS – 'of' first

Change to improper fraction $\frac{2}{5} \times \frac{7}{2} + \frac{4}{5}$

remember: 'of' means '×'

$\rightarrow \frac{\cancel{2}^{1}}{5} \times \frac{7}{\cancel{2}^{1}} + \frac{4}{5} \rightarrow \frac{7}{5} + \frac{4}{5} \rightarrow \frac{11}{5} \rightarrow 2\frac{1}{5}$

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3. $A = 2x^2 - y^2$

replace x with 3 and y with -4

$A = 2(3)^2 - (-4)^2 \qquad A = 2 \times 9 - 16$

$A = 2$

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4. $\frac{3}{m} + \frac{4}{(m+1)}$ Use common denominator

$\frac{3(m+1)}{m(m+1)} + \frac{4m}{m(m+1)} \rightarrow \frac{3(m+1)+4m}{m(m+1)}$

$\rightarrow \frac{3m+3+4m}{m(m+1)} \rightarrow \frac{7m+3}{m(m+1)}$

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5. Arrange the data in order:

1, 4, 8, 8, 9, 10, 14, 15, 20, 22, 23, 24

12 items so median is between 6th and 7th

median = 12

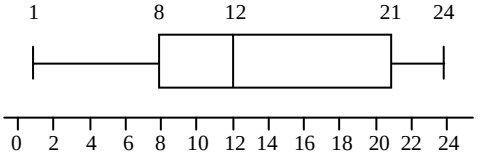
1, 4, 8, 8, 9, 10, 14, 15, 20, 22, 23, 24

LQ = 8 UQ = 21

L = 1 H = 24

We now have a 5 figure summary of the data.

Draw a box plot



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6. The special offer jar contains 12.5% more.

12.5% = $\frac{1}{8}$.

Special offer jar = $1 + \frac{1}{8} = \frac{9}{8}$

i.e. $\frac{9}{8}$ = 450 g

so $\frac{1}{8}$ = 450 ÷ 9 = 50 g

Since standard jar = whole i.e. $\frac{8}{8}$

then standard jar contains 50 × 8 g

Standard jar contains 400 g

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7. Probability of winning at school.

P(Win school) = $\frac{15}{1200}$

P(Win church) = $\frac{20}{1800}$

To compare, we need a common denominator
Choose to change to denominator of 3600

P(Win school) = $\frac{15}{1200} \times \frac{3}{3} \rightarrow \frac{45}{3600}$

P(Win church) = $\frac{20}{1800} \times \frac{2}{2} \rightarrow \frac{40}{3600}$

Better chance of winning in school raffle.

8a) Write out the sequence according to the rules.

1st term: x
2nd term y
3rd term $x + y$ (sum of previous 2 terms)
4th term $(x+y)+(y) \rightarrow x+2y$
5th term $(x+2y)+(x+y) \rightarrow 2x+3y$
and 5th term = 5 so $2x+3y=5$

8b) 1st term: y
2nd term x
3rd term $y + x$ (sum of previous 2 terms)
4th term $(y+x)+(x) \rightarrow y+2x$
5th term $(y+2x)+(y+x) \rightarrow 2y+3x$
6th term $(2y+3x)+(y+2x) \rightarrow 3y+5x$
and 6th term = 17 so $3y+5x=17$

8c). continued

Solve these equations simultaneously.

$2x+3y=5$
$3y+5x=17$ rearrange to line up x and y

$2x+3y=5 \quad ...(1)$
$5x+3y=17 \quad ...(2)$

(2) – (1) to eliminate y

$3x=12$ so $x=4$

Substitute into (1)

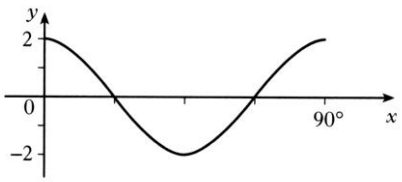
$2(4)+3y=5$

$8+3y=5$

$3y=-3 \rightarrow y=-1$

Hence: $x=4, \quad y=-1$

9.



$y=a\cos bx$

a = amplitude (max height from centre)

***a* = 2**

b = how many waves in 360°

In this case, one waveform in 90°,

so 4 waveforms in 360°

***b* = 4**

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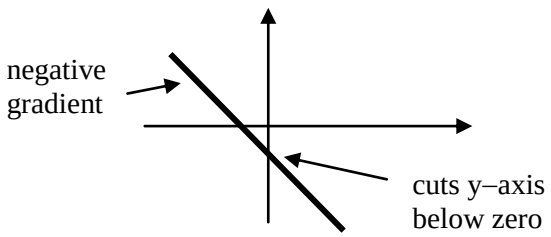
10. $y=ax+b$

If both a and b are each less than zero.

a is the gradient, so negative gradient

b is the y–intercept (where it cuts the y–axis)

So this point is below the zero.



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11. a) $2\sqrt{75}$ use rules of surds.

Look for largest square number which is a factor of 75.

$2\sqrt{75} \rightarrow 2\sqrt{25\times3}$

$\rightarrow 2\sqrt{25}\times\sqrt{3} \rightarrow 2\times5\times\sqrt{3}$

$= 10\sqrt{3}$

b) 2^0+3^{-1}

$1+\frac{1}{3} \rightarrow 1\frac{1}{3}$

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12. Circumference = length, so

$C=\pi d \Rightarrow 10=\pi d$

So diameter of circle is: $\frac{10}{\pi}$

radius is half of this. i.e. $\frac{5}{\pi}$

Area = πr^2

Area = $\pi\times\frac{5}{\pi}\times\frac{5}{\pi}$

Area = $\cancel{\pi}^{1}\times\frac{5}{\cancel{\pi}^{1}}\times\frac{5}{\pi} \rightarrow \frac{25}{\pi}$

END OF QUESTION PAPER (*Rev. March 2007)*