Starter 7th September

May 2004 3H

16. Express the algebraic fraction $\frac{2x^2-3x-20}{x^2-16}$ as simply as possible.

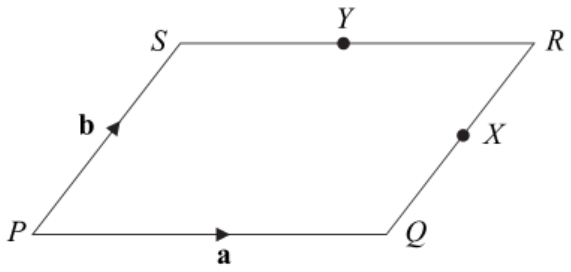
May 2004 4H

21. Solve the simultaneous equations

$$2x+y=6$$

$$x^2+y^2=20$$

22.



$PQRS$ is a parallelogram.
X is the midpoint of QR and Y is the midpoint of SR.
$\overrightarrow{PQ} = \mathbf{a}$ and $\overrightarrow{PS} = \mathbf{b}$.

(a) Write down, in terms of **a** and **b**, expressions for

(i) $\overrightarrow{PX}$

.....

(ii) $\overrightarrow{PY}$

.....

(iii) $\overrightarrow{QS}$

.....

(3)

(b) Use a vector method to show that XY is parallel to QS and that $XY = \frac{1}{2}QS$.

Nov 2004 3H

19. Express $\sqrt{98}$ in the form $a\sqrt{b}$ where a and b are integers and $a > 1$.

20. A box contains 7 good apples and 3 bad apples.

Nick takes two apples at random from the box, **without** replacement.

(a) (i) Calculate the probability that both of Nick's apples are bad.

.....

(ii) Calculate the probability that at least one of Nick's apples is good.

.....

(4)

Another box contains 8 good oranges and 4 bad oranges.

Crystal keeps taking oranges at random from the box one at a time, **without** replacement, until she gets a good orange.

(b) Calculate the probability that she takes exactly three oranges.