4. Very easy book-work.

5. Too easy to require solution here. Proceed, in the ordinary method, by substituting vx for y; or, as was elegantly done by some of the candidates, add $\frac{y^2}{4}$ to both sides of the second equation; or, still more elegantly, as was done by some of the candidates, factor the expression on the left hand side of the second equation. And so on.

6. $1-y^2=(1-y)(1+y)=\left(1-\frac{b^2+c^2-a^2}{2bc}\right)\left(1+\frac{b^2+c^2-a^2}{2bc}\right)$

$$=\frac{a^2-(b-c)^2}{2bc}\times\frac{(b+c)^2-a^2}{2bc}.$$

$$=\frac{(a-b+c)(a+b-c)(b+c-a)(b+c+a)}{4b^2c^2}.$$

$$\therefore b^2c^2(1-y^2)=4x(x-a)(x-b)(x-c).$$

7. Too easy to need solution.

8. [The only candidates by whom this question was correctly solved were Miss Catharine Grant and Mr. Jeffers. The following is Miss Grant's solution. The assumption of x^2 to represent the rate of the train leaving Hamilton is judicious. G. P. Y.]

Let x^2=rate of first train between Hamilton and Oakville.

Then $\frac{16x^2}{15}$= - - - - Oakville and P. Credit.

Also $\frac{49x^2}{60}$= distance from H. to Oakville.

$\frac{16x^2}{15}\times\frac{21}{60}=\frac{28x^2}{75}$= distance from O. to P. Credit.

Also $\left(\frac{14x}{15}\right)^2$=rate of second train from T. to P. Credit.

$\frac{\frac{49x^2}{60}+\frac{28x^2}{75}}{20\frac{2}{5}}$ = time going from P. C. to Ham.=$1\frac{25}{60}$.

[a mistake for $1\frac{15}{60}$ G.P.Y.]

$$\therefore\frac{7x^2}{120}=\frac{75}{60}\quad\therefore\ 7x^2=150$$

$$\therefore x^2=\tfrac{150}{7}.$$

$39\frac{1}{2}-\left(\frac{49x^2}{60}+\frac{28x^2}{15}\right)$=Sub. $\frac{150}{7}$ for x^2 = 14 = distance from P. C. to Toronto.

[This is awkwardly put, but, apart from the form of the expression, is correct. G. P. Y.]

$14\div\left(\frac{14x}{15}\right)^2=14\div\frac{56}{3}=\frac{3}{4}$ hr. time from T. to P. Credit.

But train arrived at P. Credit 4.45 $\therefore$ it left Toronto at 4 o'clock, P.M.

[The following are the solutions of the three deductions in the Euclid paper. G. P. Y.]

6. $2AB.\ BF=BD^2+BA^2-AD^2.$

$2CB.\ BE=BD^2+BC^2-CD^2.$

$\therefore 2(AB.\ BF+CB.\ BE)=2BD^2.$

$\therefore (AB.\ BF+CB.\ BE)=BD^2.$

7. Because GADF is a quadrilateral figure described in a circle, the rectangle GB. BA is equal to the rect. FB. BD. In like manner, because FDEC is a quad. inscribed in a circle, FB. BD=CB. BE $\therefore$ GB. BA=CB. BE. But BE=BA $\therefore$ GB.=BC.

8. If x be the perpendicular let fall from C on the straight line drawn through A parallel to BD, x is the sum of the perpendiculars let fall from C and A respectively on BD. Therefore

tri. ABC=tri. CBD+tri. ABD=$\frac{1}{2}x\times$BD.

In like manner, if y be the perp. let fall from C on the straight line drawn through B parallel to AE,

tri. ABC=$\frac{1}{2}y\times$BD.

$\therefore x\times BD=y\times BD$, and $x=y$.

SIR—In the January number of the *Journal*, one of your correspondents, Mr. Sullivan, referring to the 10th problem in the First Class Algebra paper (July, 1873), describes it as a "well-known problem." The Examiner, by whom the paper was prepared, was under the impression that the problem was new. Will your correspondent be kind enough to state, through the columns of the *Journal*, where it has previously appeared?

EXAMINER.

IX. LIST OF CERTIFICATES

Awarded by the Council of Public Instruction, and by the County and City Boards of Examiners at the December Examinations, 1873.

1. *By the Council of Public Instruction.*

MALE.

First Class.

B.

County, &c.	
*Carson, Joseph S.....Simcoe.	*Parlow, Edwin D.....Ottawa.
*Duncan, William A.....Ottawa.	

2. *By the County and City Boards of Examiners.*

MALE.

Second Class.

A.

County, &c.	
*Armstrong, Geo. H. Middlesex.	McLeay, Donald.....Wellington.
*Barr, Robert.....Kent.	Owler, William. ....Haldimand.
*Clark, Harvey.....Ontario.	Pratt, Francis..... Carleton.
Corbett, Lewis C.....Middlesex.	Pyne, Albert R.....York.
Cornell, Daniel.....Lambton.	Rittenhouse, Wm. F....Lincoln.
*Jones, Edgar.....York.	Robinson, Templeton C.....Peel.
Johnson, Hugh D... Wellington.	*Rowat, Isaac S.....Simcoe.
*Lehman, William.....York.	Sharp, James A.....Hamilton.
Lee, Archibald.....Ottawa.	Sheldon, George W.....Kent.
Linton, Adam R.....Durham.	*Shepherd, Richard...Lambton.
Mundell, James M.....Perth.	Squier, Isaac C.....Hastings.
*Murray, Robert.....York.	Stephen, Alexander.....Grey.
McFarlane, David...Wellington.	Tilley, Wm....Lennox & Addington.
McGurn, Joseph S....Hastings.	Woodburne, Thos....Middlesex.

* *Normal School Students.*

B.

Allen, David S.....Wellington.	Kaufman, Jacob.....Waterloo.
Bingeman, Joseph....Waterloo.	Marshall, James... ..Hamilton.
Black, James C.....Elgin.	*Miller, Thomas.....Huron.
*Blackman, Theodore W. Haldimand.	McDonald, Ronald...Lambton.
*Brown, William G.....Ontario.	*McIlmoyle, John D.....York.
Clark, John W.....Oxford.	McIntyre, Alexander...Victoria.
Coleman, Harvey K.....Leeds & Grenville.	*McKellar, James.....Elgin.
Cornell, Warner.....Lambton.	McKenzie, William.....Perth.
*Crawford, Peter.....Kent.	McLaren, Peter.....Wellington.
Davis, James W.....Lanark.	*McRae, Alexander.....York.
Davidson, Wm.....Wentworth.	O'Donnell, Patrick J....Leeds & Grenville.
*Dean, James H.....Norfolk.	Quin, Andrew.....Grey.
*Dorland, Solomon M...Prince Edward.	Robertson, David.....Peterborough.
Dunsmore, Thomas...Lambton.	Robertson, Duncan.....Ottawa.
Eyre, Holmes.....Leeds & Grenville.	*Sinclair, Samuel B.. .... Elgin.
*Fletcher, Wm. M..Wentworth.	Smith, Daniel F. .....Perth.
French, Wm. J.....Ottawa.	Snell, Joseph.....Huron.
Godfrey, Thomas.....Perth.	Staples, Joseph. ..... Durham.
Greig, John.. ....Bruce.	Stewart, George.....Huron.
James, Moses A.....Durham.	Stott, William.....Durham.
Jamieson Wm.....Wellington.	Sutherland Alex. F.....Dundas.
Johnson, Fred. W ....Prince Edward.	Telfer John..... .....Lambton.
	Woodworth, Sandford C..Elgin.

* *Normal School Students.*

FEMALE.

A.

*Belfry, Frances.....York.	*Kahler, Louisa E.....York.
*Carter, Emma.....London.	Weatherston, Mary..Middlesex.
*Cornor, Mary M. L. J....York.	

B.

Barbour, Agnes E.....Perth.	*Lemon, Elizabeth.....Welland.
*Buckle, Hattie.....London.	*Mills, Mary Ann.....York.
Cameron, Catherine...Glengarry.	*Mitchell, Rachel.....Leeds & Grenville.
Coulton, Martha.....Hamilton.	*McCreight, Elizabeth.....York.
*Cooper, Maggie.....Welland.	*McIntyre, Agnes.....York.
*Davidson, Victoria.....York.	*Patterson, Lizzie C. ...Lincoln.
De Witt, Maggie.....Lincoln.	*Pearson, Elizabeth A....York.
*Eyres, Sarah J.....Durham.	Reid, Catherine.....Wellington.
*Hagarty, Sara.....York.	Smith, Louisa.....Carleton.
Harvey, L.....Hamilton.	*Stevenson, Eliza J.....Simcoe.
*Hughes, Caroline.....Durham.	*Vanderburgh, Alice.. Welland.
Kennedy, Jessie.....Hamilton.	
Kirkup, Annie F.....Leeds & Grenville.	

* *Normal School Students.*