1 Given that $n > 0$

make n the subject of the formula $y = \dfrac{n^2 + d}{n^2}$

$$y = \frac{n^2 + d}{n^2} \bigg) \times n^2$$

$$yn^2 = n^2 + d \quad \text{①} \bigg) - n^2$$

$$yn^2 - n^2 = d \quad \text{①}$$

$$n^2(y-1) = d \quad \text{①} \bigg) \div (y-1)$$

$$n^2 = \frac{d}{y-1} \bigg) \sqrt{}$$

$$n = \sqrt{\frac{d}{y-1}} \quad \text{①}$$

$$n = \sqrt{\frac{d}{y-1}}$$

(Total for Question 1 is 4 marks)

2 Make x the subject of $y = \dfrac{5 - 2x}{x + 3}$

$$y = \frac{5 - 2x}{x + 3}$$

$$y(x+3) = 5 - 2x$$

$$yx + 3y = 5 - 2x \quad ①$$

$$yx + 2x = 5 - 3y \quad ①$$

$$x(y+2) = 5 - 3y \quad ①$$

$$\div y + 2$$

$$x = \frac{5 - 3y}{y + 2} \quad ①$$

$$x = \frac{5 - 3y}{y + 2}$$

(Total for Question 2 is 4 marks)

3 (a) Make *a* the subject of $d = g + 2ac$

$$d = g + 2ac$$

$$d - g = 2ac \quad \text{①}$$

$$2a = \frac{d-g}{c}$$

$$a = \frac{d-g}{2c} \quad \text{①}$$

$$a = \frac{d-g}{2c}$$

(2)

(Total for Question 3 is 2 marks)

4   Make x the subject of $y = \sqrt{\dfrac{x+1}{x-4}}$

$$y = \sqrt{\frac{x+1}{x-4}}$$

$$y^2 = \frac{x+1}{x-4} \quad ①$$

$$y^2(x-4) = x+1 \quad ①$$

$$y^2x - 4y^2 = x+1$$

$$y^2x - x = 4y^2 + 1 \quad ①$$

$$x(y^2-1) = 4y^2 + 1$$

$$x = \frac{4y^2+1}{y^2-1} \quad ①$$

$$x = \frac{4y^2+1}{y^2-1}$$

(Total for Question 4 is 4 marks)

5 (b) Make t the subject of the formula $p = at - d$

$$p = at - d$$
$$p + d = at \quad ①$$
$$t = \frac{p+d}{a} \quad ①$$

$$t = \frac{p+d}{a}$$

(2)

(Total for Question 5 is 2 marks)

6 (a) Make c the subject of $A = \dfrac{c}{y} - 5z$

$$A = \frac{c}{y} - 5z \quad \Big) \times y$$

$$Ay = c - 5yz \quad ① \quad \Big) + 5yz$$

$$c = Ay + 5yz$$

$$c = y(A + 5z) \quad ①$$

$$c = y(A + 5z)$$

....

(2)

(Total for Question 6 is 2 marks)

7 (b) Make c the subject of the formula $p = \sqrt{\dfrac{ac + 8}{3 + c}}$

$$p = \sqrt{\frac{ac+8}{3+c}}$$

$$p^2 = \frac{ac+8}{3+c} \quad \text{①}$$

$$p^2(3+c) = ac+8$$

$$3p^2 + p^2c = ac+8 \quad \text{①}$$

$$3p^2 - 8 = ac - p^2c \quad \text{①}$$

$$3p^2 - 8 = c(a-p^2)$$

$$c = \frac{3p^2-8}{a-p^2} \quad \text{①}$$

$$\frac{3p^2-8}{a-p^2}$$

....

(4)

(Total for Question 7 is 4 marks)

8 (b) Make c the subject of $g = \dfrac{c+3}{4+c} - 7$

$$g + 7 = \frac{c+3}{4+c} \quad ①$$

$$(g+7)(4+c) = c+3$$

$$4g + 9c + 28 + 7c = c + 3 \quad ①$$

$$9c + 7c - c = 3 - 28 - 49 \quad ①$$

$$c(g+6) = -49 - 25$$

$$c = \frac{-(49+25)}{9+6} \quad ①$$

$$c = \frac{-(49+25)}{9+6}$$

(4)

(Total for Question 8 is 4 marks)

9 $a = \dfrac{14}{3x - 7}$ $x = \dfrac{7}{4y - 3}$

Express a in the form $\dfrac{py + q}{ry + s}$ where p, q, r and s are integers.

Give your answer in its simplest form.

$$a = \frac{14}{3\left(\frac{7}{4y-3}\right) - 7} \ \textcircled{1}$$

$$= \frac{14}{\frac{21}{4y-3} - 7}$$

$$= \frac{14(4y-3)}{21 - 7(4y-3)} \ \textcircled{1}$$

$$= \frac{56y - 42}{21 - 28y + 21}$$

$$= \frac{56y - 42}{42 - 28y}$$

$$= \frac{\cancel{14}(4y-3)}{\cancel{14}(3-2y)} \ \textcircled{1}$$

$a =$ ....$\dfrac{4y - 3}{3 - 2y}$.........

(Total for Question 9 is 3 marks)

10 Make t the subject of $n^2 = \dfrac{4d + t^3}{t^3}$

$n^2 t^3 = 4d + t^3$ ①

$n^2 t^3 - t^3 = 4d$

$t^3(n^2 - 1) = 4d$ ①

$t^3 = \dfrac{4d}{n^2 - 1}$ ①

$t = \sqrt[3]{\dfrac{4d}{n^2 - 1}}$ ①

$t = \sqrt[3]{\dfrac{4d}{n^2 - 1}}$

(Total for Question 10 is 4 marks)

11 (d) Make *t* the subject of $c = t^3 - 8v$

$t^3 = c + 8v$ ①

$t = \sqrt[3]{c + 8v}$ ①

$t = \sqrt[3]{c + 8v}$

(2)

(Total for Question 11 is 2 marks)

12 Make x the subject of $y = \sqrt[3]{\dfrac{6 + 5x}{x + 4}}$

$$y^3 = \frac{6 + 5x}{x + 4} \quad \textcircled{1}$$

$$y^3 x + 4y^3 = 6 + 5x \quad \textcircled{1}$$

$$y^3 x - 5x = 6 - 4y^3 \quad \textcircled{1}$$

$$x(y^3 - 5) = 6 - 4y^3$$

$$x = \frac{6 - 4y^3}{y^3 - 5} \quad \textcircled{1}$$

$$x = \frac{6 - 4y^3}{y^3 - 5}$$

(Total for Question 12 is 4 marks)

13 (b) Make e the subject of $w = \sqrt{\dfrac{e+g}{ef-d}}$

$$w^2 = \frac{e+g}{ef-d} \quad ①$$

$$w^2(ef-d) = e+g$$

$$w^2ef - w^2d = e+g \quad ①$$

$$w^2ef - e = g + w^2d \quad ①$$

$$e(w^2f - 1) = g + w^2d$$

$$e = \frac{g+w^2d}{w^2f-1} \quad ①$$

$$e = \frac{g+w^2d}{w^2f-1}$$

(4)

(Total for Question 13 is 4 marks)