

January 2022 Paper 1H

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

$$\begin{aligned} c + 8v &= t^3 \\ \sqrt[3]{c + 8v} &= t \end{aligned}$$

(2)



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- 1 (a) Make a the subject of the formula $M = ac - bd$

$$+bd \quad +bd$$

$$m + bd = ac$$

$$\div c \quad \div c$$

$$\frac{m + bd}{c} = a$$

(2)



P 5 4 6 9 5 A 0 3 2 4

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

$$\begin{aligned} & \quad -g \quad -g \\ d - g &= 2ac \\ \div 2c \quad \div 2c & \\ \frac{d-g}{2c} &= a \end{aligned}$$

(2)

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

$$\begin{aligned} & \quad +d \quad +d \\ p+d &= at \\ \div a \quad \div a \\ \frac{p+d}{a} &= t \end{aligned}$$

(2)

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

$$+5z \qquad +5z$$

$$A + 5z = \frac{c}{y}$$

$$\times y \qquad \times y$$

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

$$yA + 5yz = c$$

(2)



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10 (c) Make f the subject of $x = \sqrt{\frac{1}{3}f}$

$$x^2 = \frac{1}{3}f$$

$\times 3$
 $\times 3$

$$3x^2 = f$$

(2)



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

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

$$\times(3+c) \quad \times(3+c)$$

$$3p^2 + cp^2 = ac + 8$$

$$-3p^2 \quad -3p^2$$

$$cp^2 = ac + 8 - 3p^2$$

$$-ac \quad -ac$$

$$cp^2 - ac = 8 - 3p^2$$

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

$$\div(p^2 - a) \quad \div(p^2 - a)$$

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

(4)



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(b) Make c the subject of the formula $f = \sqrt{\frac{a+bc}{c-d}}$

$$f^2 = \frac{a+bc}{c-d}$$

$$f^2(c-d) = a+bc$$

$$f^2c - f^2d = a+bc$$

$$f^2c = a+bc+f^2d$$

$$f^2c - bc = a+f^2d$$

$$c(f^2 - b) = a+f^2d$$

$$c = \frac{a+f^2d}{f^2 - b}$$

(4)



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(d) Make r the subject of $m = \sqrt{\frac{6a+r}{5r}}$

$$m^2 = \frac{6a+r}{5r}$$

$$5m^2r = 6a+r$$

$$6m^2r - r = 6a$$

$$r(6m^2 - 1) = 6a$$

$$\div (6m^2 - 1) \quad \div (6m^2 - 1)$$

$$r = \frac{6a}{6m^2 - 1}$$

(4)



P 5 9 0 1 9 A 0 1 3 2 4

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

$$g+7 = \frac{c+3}{4+c}$$

$$\times(4+c) \quad \times(4+c)$$

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

$$4g + gc + 28 + 7c = c + 3$$

$$gc + 28 + 7c = c + 3 - 4g$$

$$gc + 28 + 6c = 3 - 4g$$

$$gc + 6c = -25 - 4g$$

$$c(g+6) = -25 - 4g$$

$$c = \frac{-25 - 4g}{g+6}$$

(4)

14



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November 2020 P2H

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

$$x(x+3) \quad x(x+3)$$

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

$$yx + 3y = 5 - 2x$$

$$yx = 5 - 2x - 3y$$

$$yx + 2x = 5 - 3y$$

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

$$\div(y+2) \quad \div(y+2)$$

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

(Total for Question 15 is 4 marks)

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15 (a) Make g the subject of $e = \sqrt{\frac{7g+5}{11+2g}}$

$$e^2 = \frac{7g+5}{11+2g}$$

$$\times(11+2g) \quad \times(11+2g)$$

$$e^2(11+2g) = 7g+5$$

$$11e^2 + 2e^2g = 7g + 5$$

$$-11e^2 \qquad -11e^2$$

$$2e^2g = 7g + 5 - 11e^2$$

$$-7g \quad -7g$$

$$2e^2g - 7g = 5 - 11e^2$$

$$g(2e^2 - 7) = 5 - 11e^2$$

$$\div(2e^2 - 7) \quad \div(2e^2 - 7)$$

$$g = \frac{5 - 11e^2}{2e^2 - 7}$$

(4)



P 7 3 9 9 4 A 0 1 5 2 8

15 Make n the subject of the formula $x = \frac{3p+n}{3n-4}$

$$x(3n-4) \quad x(3n-4)$$

$$x(3n-4) = 3p+n$$

$$3nx - 4x = 3p+n$$

$$3nx \quad +4x = 3p+n+4x$$

$$3nx - n = 3p + 4x$$

$$n(3x-1) = 3p + 4x$$

$$\div(3x-1) \quad \div(3x-1)$$

$$n = \frac{3p+4x}{3x-1}$$

(Total for Question 15 is 3 marks)



15 Make x the subject of the formula $y = \sqrt{\frac{3x-2}{x+1}}$

$$y^2 = \frac{3x-2}{x+1}$$

$$y^2(x+1) = 3x-2$$

$$y^2x + y^2 = 3x - 2$$

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

$$x(y^2 - 3) = -2 - y^2$$

$$x = \frac{-2 - y^2}{y^2 - 3}$$

(Total for Question 15 is 4 marks)



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

$$\begin{aligned}
 & \quad \times t^3 \qquad \qquad \times t^3 \\
 n^2 t^3 &= 4d + t^3 \\
 -t^3 & \qquad \qquad -t^3 \\
 n^2 t^3 - t^3 &= 4d \\
 t^3 (n^2 - 1) &= 4d \\
 \div (n^2 - 1) & \qquad \div (n^2 - 1) \\
 t^3 &= \frac{4d}{n^2 - 1} \\
 \sqrt[3]{} & \qquad \sqrt[3]{} \\
 t &= \sqrt[3]{\frac{4d}{n^2 - 1}}
 \end{aligned}$$

(Total for Question 15 is 4 marks)



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

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

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

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

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

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

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

(Total for Question 16 is 4 marks)



17 Given that $n > 0$ make n the subject of the formula $y = \frac{n^2 + d}{n^2}$

$$\begin{array}{cc} \times n^2 & \times n^2 \end{array}$$

$$yn^2 = n^2 + d$$

$$\begin{array}{cc} -n^2 & -n^2 \end{array}$$

$$yn^2 - n^2 = d$$

$$n^2(y-1) = d$$

$$\begin{array}{cc} \div (y-1) & \div (y-1) \end{array}$$

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

$$\begin{array}{cc} \sqrt{} & \sqrt{} \end{array}$$

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

(Total for Question 17 is 4 marks)

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(b) Make f the subject of $w = \frac{2f + 3}{8 - f}$

$$\times (8-f) \quad \times (8-f)$$

$$w(8-f) = 2f + 3$$

$$8w - wf = 2f + 3$$

$$+wf \quad +wf$$

$$8w \quad = 2f + 3 + wf$$

$$-3 \quad -3$$

$$8w - 3 = 2f + wf$$

$$8w - 3 = f(2 + w)$$

$$\div (2+w) \quad \div (2+w)$$

$$\frac{8w - 3}{2 + w} = f$$

(3)

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17 Make x the subject of $y = \sqrt[3]{\frac{6-5x}{x+4}}$

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

$$x(x+4) \quad x(x+4)$$

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

$$y^3x + 4y^3 = 6-5x$$

$$y^3x + 4y^3 - 5x = 6$$

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

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

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

(Total for Question 17 is 4 marks)



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

$$\begin{aligned}
 w^2 &= \frac{e+g}{ef-d} \\
 w^2(e+g) &= (ef-d)w^2 \\
 w^2ef - w^2d &= e+g \\
 w^2ef - e &= g+w^2d \\
 e(w^2f-1) &= g+w^2d \\
 e &= \frac{g+w^2d}{w^2f-1}
 \end{aligned}$$

(4)



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(b) Make m the subject of $p^2 = \frac{x+m}{2m-y}$

$$x(2m-y) \quad x(2m-y)$$

$$p^2(2m-y) = x+m$$

$$2mp^2 - yp^2 = x+m$$

$$2mp^2 - yp^2 - m = x$$

$$2mp^2 - m = x + yp^2$$

$$m(2p^2 - 1) = x + yp^2$$

$$\div (2p^2 - 1) \quad \div (2p^2 - 1)$$

$$m = \frac{x + yp^2}{2p^2 - 1}$$

(3)



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