

IGCSE Higher Week 3 Answers

1 a, $3(x+2)$ b, $7(3y-5)$ c, $9(2+3b)$ d, $y(7-y)$ e, $x(3-x)$
 f, $x(y+2x)$ g, $4a(1+5a)$ h, $4b(4b+6)$ i, $x(a+b)$ j, $m(3x-d)$
 k, $xy(x+1)$ l, $5ay(a+2y^2)$ m, $abc(a^2c-4)$ n, $8m^2n^2(3mt+4no)$
 o, $d^2(5ab-4c)$

2 a, $4xy+2y^2 \Rightarrow 2y(2x+y)$ \therefore Perimeter = $4y+4x+2y = 6y+4x$
 b, $9a^2-3ab \Rightarrow 3a(3a-b)$ \therefore Perimeter = $6a+6a-2b = 12a-2b$

3 a, $x=T-v$ b, $x=\frac{k+r}{m}$ c, $x=\frac{at+2t}{R}$ d, $x=b/\sqrt{2}$ e, $x=\frac{N}{m}-1$
 f, $x=\frac{y+tr}{g}$ g, $x=\frac{y-c}{m}$ h, $x=m-p$ i, $x=n+ty$ j, $x=\frac{na-rs}{n}$

k, $x=tr+5$ l, $x=\frac{3m}{2}$ m, $x=\frac{dc-b}{a}$ n, $x=\sqrt{\frac{kl}{j}}$ o, $x=\sqrt{\frac{m+u}{4}}$

p, $x=\frac{m}{d+m}$ q, $x=R(v-1)$ r, $x=\frac{h}{a}$ s, $x=\frac{m^2}{ab}$ t, $x=t^2$ u, $x=b^2+a$

4 a, $r=\frac{m^2k+t}{2s}$ b, $r=\sqrt{\frac{v}{2h}}$ c, $r=\frac{ax}{tu}$ d, $r=\frac{ab-d}{s}$ e, $r=\frac{(ts)^2}{s}$

5 a, $x=\frac{T}{a+d}$ b, $x=\frac{uv}{s-a}$ c, $x=\frac{r-t}{a-b}$ d, $x=\frac{T-y}{m+k}$

e, $x=\frac{3a+5m}{m-n}$ f, $x=\frac{T-mT}{m+1}$ g, $x=\frac{sy+tr}{i-s}$ h, $x=\frac{tu-sr}{r+t}$

6 a, $y=Rxc$ b, $P=kt$ c, $A=KL$ d, $n=Rm^2$ e, $R=k\sqrt{s}$

7 a, $y=kx \Rightarrow \boxed{y=3x}$ b, $y=24$ c, $x=3$
 $12 = k \times 4$
 $\therefore k = \frac{12}{4} = 3$

8 a, $\boxed{t=5s}$ b, $t=35$ c, $s=11$

9 a, $B=Rm^2 \Rightarrow \underline{B=3m^2}$ b, $B=3 \times 25 = 75$ c, $48=3m^2$
 $12=R \times 4$
 $R=3$
 $m^2=16$
 $\underline{m=4}$

10 a, $4=kt \Rightarrow t=4a^2$ a, $t=100$ b, $a=3$
 $R=4$

11/ $P \propto d \Rightarrow P = kd$
 $200 = k \times 5$
 $k = 40$

when $d = 8m$
 $P = 40 \times 8$
 $= \underline{320 \text{ newtons/cm}}$

$P = 40d$

12/ $E = kx^2$
 $243 = k \times 9$
 $k = 27$

$E = 27x^2$

a/ when ext = 5
 $E = 27 \times 5^2$
 $E = 675J$

b/ when $E = 108$
 $108 = 27x^2$
 $x^2 = 4$
 $x = 2cm$

13/ a/ $y = \frac{k}{x}$ b/ $p = \frac{k}{m}$ c/ $y = \frac{k}{x^2}$ d/ $R = \frac{k}{\sqrt{s}}$

14/ $y = \frac{k}{x}$ $10 = \frac{k}{2} \Rightarrow y = \frac{20}{x}$ b/ $y = 4$ c/ $40x = 20$
 $k = 20$ $x = \frac{1}{2}$

15/ $d = \frac{k}{c} \Rightarrow \boxed{d = \frac{12}{c}}$ a/ when $c = 12$ $\underline{d = 1}$ b/ when $d = 3$ $\underline{c = 4}$ $3 = \frac{12}{c}$ $c = \frac{12}{3}$

16/ $p = \frac{k}{\sqrt{r}}$ $1.2 = \frac{k}{\sqrt{100}}$ $k = 12$ a/ $P = \frac{12}{\sqrt{4}} = \underline{6}$ b/ $r = \left(\frac{12}{3}\right)^2 = \underline{16}$
 $\boxed{P = \frac{12}{\sqrt{r}}}$

17/ $v = \frac{k}{t^2}$ $25 = \frac{k}{4} \therefore k = 100$

t	2	5	20	10
v	25	4	$\frac{1}{4}$	1

$\boxed{v = \frac{100}{t^2}}$

$5 = \frac{1000}{P}$

18/ $v = \frac{k}{P}$ $2 = \frac{k}{500} \therefore k = 1000$ a/ $v = \frac{1000}{400} = \underline{2.5m^3}$ b/ $P = \frac{1000}{5}$
 $P = \underline{200 N/m^2}$
 $\boxed{v = \frac{1000}{P}}$

19/ $F = \frac{k}{d^2}$ $18 = \frac{k}{4}$ $k = 72$ $\boxed{F = \frac{72}{d^2}}$ $2 = \frac{72}{d^2}$ $d = \sqrt{\frac{72}{2}} = 6cm$

20/ $20g \div (1.994 \times 10^{-23}) \Rightarrow \frac{2 \times 10}{2 \div 1.994} \div \frac{1.994 \times 10^{-23}}{10 \div 10^{-23}} \Rightarrow 1.0 \times 10^{24} \text{ atoms}$

21/ a/ $(x-3)(x-2)$ b/ $(x-7)(x+4)$ c/ $(x-7)(x+7)$

22/ a/ x^2 b/ $4x^3$ c/ $x^{-3}y^{-5} \Rightarrow \frac{1}{x^3y^5}$ d/ $3x^{\frac{1}{2}}$

23/ London £355 NY \$465
 $\text{if } £0.76 = \$1$ $465 \times 0.76 = £353.40$ it
 Camera cheaper in New York