[2] $\sum_{n=0}^{27} \binom{27}{n} \left(\frac{1}{7}x^{-2}\right)^{27-n} \left(-\frac{1}{5}x^{\frac{1}{3}}\right)^{n}$ (5)

$= \sum_{n=0}^{27} \binom{27}{n} \left(\frac{1}{7}\right)^{27-n} \left(-\frac{1}{5}\right)^{n} x^{-2(27-n)+\frac{1}{3}n}$

$= \sum_{n=0}^{27} (-1)^n \binom{27}{n} \left(\frac{1}{7}\right)^{27-n} \left(\frac{1}{5}\right)^{n} x^{-54+\frac{7}{3}n}$ (3)

$-54+\frac{7}{3}n = -5$ (3)

$\frac{7}{3}n = 49$

$n = 49 \cdot \frac{3}{7}$

$n = 21$ (2)

$(-1)^{21} \binom{27}{21} \left(\frac{1}{7}\right)^{27-21} \left(\frac{1}{5}\right)^{21}$

$= -\frac{9 \cdot 13 \cdot 5 \cdot 23 \cdot 22}{7^6 \cdot 5^{21}}$ (2) (4) (2) or $-\frac{9 \cdot 13 \cdot 23 \cdot 22}{7^6 \cdot 5^{20}}$

$\binom{27}{21} = \frac{27!}{21!\,6!} = \frac{\cancel{27}^{9} \cdot \cancel{26}^{13} \cdot \cancel{25}^{5} \cdot 24 \cdot 23 \cdot 22 \cdot \cancel{21!}}{\cancel{21!}\,6 \cdot \cancel{8} \cdot 4 \cdot \cancel{3} \cdot 2 \cdot 1}$ (4)

[3] NUMERATORS $5!, 4!, 3!, 2!, 1!, 0!$

DENOMINATORS $\frac{112}{224} = \frac{1}{2}$

$112 \cdot \frac{1}{2} = 56 \quad 56 \cdot \frac{1}{2} = 28 \quad 28 \cdot \frac{1}{2} = 14 \quad 14 \cdot \frac{1}{2} = 7$

GEOMETRIC SEQUENCE $r = \frac{1}{2}$

(4) $\sum_{n=1}^{6} \frac{(-1)^{n+1}}{224 \cdot (\frac{1}{2})^{n-1}} \frac{(6-n)!}{}$ (2) (4) (5) OR $\sum_{n=0}^{5} (-1)^n \frac{(5-n)!}{224 \cdot (\frac{1}{2})^n}$

[4]

(4) $\sinh t = \frac{x-5}{-2}$ $\quad \cosh t = \frac{y+4}{3}$ (4)

$\cosh^2 t - \sinh^2 t = 1$ (8)

$\left(\frac{y+4}{3}\right)^2 - \left(\frac{x-5}{-2}\right)^2 = 1$

$\left(\frac{y+4}{3}\right)^2 - \left(\frac{x-5}{2}\right)^2 = 1$ (4)

[5] a_n = REVENUE ON n-TH DAY

$= a_1 + (n-1)d$ (6)

$a_5 = a_1 + 4d = 640$

$a_{14} = a_1 + 13d = 910$ } ⊖

$9d = 270$ (6)

$d = 30$ (2)

$a_1 + 4(30) = 640$ (3)

$a_1 = 520$ (2)

DAY 1 = MAY 4

DAY 5 = MAY 8

DAY 14 = MAY 17

DAY 36 = JUNE 8 ≈ MAY 39

$S_{36} = \frac{36}{2}(2(520) + 35(30))$ (6) (6)

$= 18(1{,}040 + 1{,}050)$

$= 18(2{,}090)$

$= 37{,}620$ DOLLARS (2) (2)

[6] $v_0 = 12 \quad h = 3 \quad \theta = 45°$

⑥ $x = (12\cos 45°)t$

⑨ $y = 3 + (12\sin 45°)t - 16t^2$

$\longrightarrow$ $x = 12 \cdot \frac{\sqrt{2}}{2} t$

$y = 3 + 12 \cdot \frac{\sqrt{2}}{2} t - 16t^2$

$\downarrow$

⑤ $x = 6\sqrt{2}t$

$y = 3 + 6\sqrt{2}t - 16t^2$

[7]

$$\frac{(8n+1)!}{(8n-3)!\,(8n+1-(8n-3))!} = \boxed{\frac{(8n+1)!}{(8n-3)!\,4!}} \quad (5)$$

$$= \overset{(5)}{\boxed{\frac{(8n+1)(8n)(8n-1)(8n-2)(8n-3)!}{(8n-3)!\cdot 4\cdot 3\cdot 2\cdot 1}}}$$

$$= \overset{(5)}{\boxed{\frac{2n}{3}(8n+1)(8n-1)(8n-2)}}$$

[8] CENTER $= \left(\frac{5+-13}{2}, \frac{-8+-2}{2}\right) = \boxed{(-4,-5)}$ (5)

RADIUS $= \frac{1}{2}\sqrt{(-13-5)^2+(-2--8)^2}$

$= \frac{1}{2}\sqrt{(-18)^2+6^2}$

$= \frac{1}{2}\cdot 6\sqrt{(-3)^2+1^2} = \boxed{3\sqrt{10}}$ (7½)

$\boxed{x = -4 + 3\sqrt{10}\cos t}$

$\boxed{y = -5 + 3\sqrt{10}\sin t}$

(7½) + (5)

1ST EQ'N 2ND EQ'N

[9] $0.3+(0.084+0.00084+0.0000084+\cdots)$ (5)

$*\frac{1}{100}$ $*\frac{1}{100}$

INFINITE GEOMETRIC SERIES $r=\frac{1}{100}$

$$= \frac{3}{10} + \frac{\frac{84}{1000}}{1-\frac{1}{100}} \cdot \frac{1000}{1000}$$ (4) (4) (4)

$$= \frac{3}{10} + \frac{84}{1000-10}$$

$$= \frac{3}{10} + \frac{84}{990} = \frac{3}{10} + \frac{28}{330}$$ (2) (4)

$$= \frac{3(33)+28}{330}$$

$$= \frac{127}{330}$$ (2)