Half Term 2B (ANSWERS)	Week 1

1

$Repeated\ root\ b^2 - 4ac = 0$
$p^2 - 4 \times (p-3) \times 3 = 0$
$p^2 - 12p + 36 = 0$
$(p-6)^2 = 0$
$p = 6$

2

$No\ real\ roots\ \ b^2 - 4ac < 0$
$(2p)^2 - 4 \times p \times 3 < 0$
$4p^2 - 12p < 0$
$4p(p-3) < 0$
$0 < p < 3$

3

2y + 4x = 7
y=3.5 – 2x Gradient = -2
(y – 5) = -2(x – 1)
y – 5 = -2x +2
2x + y =7

4

$1 + 7(2x) + \frac{7\times6}{1\times2}(2x)^2 + \frac{7\times6\times5}{1\times2\times3}(2x)^3$

$1 + 14x + 84x^2 + 280x^3$

5

$\frac{6\sqrt{3}-4}{2-\sqrt{3}} \times \frac{2+\sqrt{3}}{2+\sqrt{3}}$

$= \frac{10+8\sqrt{3}}{1}$

$10 + 8\sqrt{3}$

Half Term 2B (ANSWERS)	Week 2

1

$Repeated\ root\ b^2 - 4ac = 0$

$(k+6)^2 - 4 \times 8 \times k = 0$

$k^2 + 12k + 36 - 32k = 0$

$k^2 - 20k + 36 = 0$

$(k-2)(k-18) = 0$

$k = 2 \quad k = 18$

2

$No\ real\ roots \quad b^2 - 4ac < 0$

$(2p)^2 - 4 \times 1 \times 1 < 0$

$4p^2 - 4 < 0$

$4(p^2 - 1) < 0$

$-1 < p < 1$

3

6y + 3x = -4

y=-1.5 –0.5x Gradient = -½

(y – 4) = -½ (x + 3)

-2y + 8 = x + 3

x + 2y = 5

4

$1 + 10(-4x) + \frac{10\times9}{1\times2}(-4x)^2 + \frac{10\times9\times8}{1\times2\times3}(-4x)^3$

$1 - 40x + 720x^2 - 7680x^3$

5

$\frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}} \times \frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}+\sqrt{3}}$

$= \frac{8+2\sqrt{15}}{2}$

$4 + \sqrt{15}$

Half Term 2B (ANSWERS)	Week 3

1

$Repeated\ root\ b^2 - 4ac = 0$

$k^2 - 4 \times 9 \times (k - 5) = 0$

$k^2 - 36k + 180 = 0$

$(k - 6)(k - 30) = 0$

$k = 6 \quad k = 30$

2

$Real\ and\ distinct\ roots\ b^2 - 4ac > 0$

$(p)^2 - 4 \times 3 \times 3 > 0$

$p^2 - 36 > 0$

$(p - 6)(p + 6) < 0$

$p < -6\ or\ p > 6$

3

Gradient = $\frac{5--3}{4-2} = 4$

Perpendicular gradient = -¼

(y + 3) = -¼ (x - 2)

-4y – 12 = x – 2

x + 4y = -10

4

$2^{10} + 10(2)^9(-3x) + \frac{10\times9}{1\times2}(2)^8(-3x)^2$

$1024 - 15360x + 103680x^2$

5

$2^x \times 2^{-2} \times 2^3 = 2^7$

$x - 2 + 3 = 7$

$x + 1 = 7$

$x = 6$

Half Term 2B (ANSWERS)	Week 4

1

$Repeated\ root\ b^2 - 4ac = 0$

$(p+5)^2 - 4 \times (p-1) \times 8 = 0$

$p^2 + 10p + 25 - 32p + 32 = 0$

$p^2 - 22p + 57 = 0$

$(p-19)(p-3) = 0$

$p = 3 \quad p = 19$

2

$Real\ and\ distinct\ roots\ b^2 - 4ac > 0$

$(4)^2 - 4 \times p \times (5-p) > 0$

$16 - 20p + 4p^2 > 0$

$4(p-4)(p-1) < 0$

$p < 1\ or\ p > 4$

3

Gradient = $\frac{9--1}{-6-4} = -5$

(y - 3) = -5(x - 6)

y - 3= -5x + 30

5x + y = 33

4

$\frac{9\times8\times7}{1\times2\times3}(4^6)\left(\frac{x}{2}\right)^3$

$43008(x^3)$

5

$3^3 \times 3^{-2} \times 3^{-x} = 3^{-4}$

$3 - 2 - x = -4$

$x = 5$

Half Term 2B (ANSWERS)	Week 5

1

$Repeated\ root\ b^2 - 4ac = 0$

$(p+4)^2 - 4 \times (p-1) \times 5 = 0$

$p^2 + 8p + 16 - 20p + 20 = 0$

$p^2 - 12p + 36 = 0$

$(p-6)^2 = 0$

$p = 6$

2

$No\ real\ roots \quad b^2 - 4ac < 0$

$(3(p+1))^2 - 4 \times 1 \times (p+1) < 0$

$9p^2 + 18p + 9 - 4p - 4 < 0$

$9p^2 + 14p + 5 < 0$

$(9p+5)(p+1) < 0$

$-1 < p < -\frac{5}{9}$

3

2y = x + 5

y= ½x + 2.5

Perpendicular gradient = -2

(y – 4) = -2(x + 2)

y – 4 = -2x - 4

2x + y = 0

4

$\frac{10\times9\times8\times7}{1\times2\times3\times4}(3^6)(\frac{x}{3})^4$

$1890(x^4)$

5

$2\sqrt{2} - 4\sqrt{2} + 8\sqrt{2} = 6\sqrt{2}$

Half Term 2B (ANSWERS)	Week 6

1

$Repeated\ root\ b^2 - 4ac = 0$

$(k+3)^2 - 4 \times (k-3)(k+3) = 0$

$k^2 + 6k + 9 - 4k^2 + 36 = 0$

$-3k^2 + 6k + 45 = 0$

$k^2 - 2k - 15 = 0$

$(k-5)(k+3) = 0$

$k = 5 \quad k = -3$

2

$Real\ and\ disinct\ roots\ b^2 - 4ac > 0$

$(-(1+p))^2 - 4 \times 2 \times (5-p) > 0$

$1 + 2p + p^2 - 40 + 8p > 0$

$p^2 + 10p - 39 > 0$

$(p+13)(p-3) < 0$

$p < -13\ or\ p > 3$

3

5y = 2x + 10

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

(y – 3) = - $\frac{5}{2}$(x + 4)

2y – 6 = -5x - 20

5x + 2y = - 14

4

$\frac{8\times7\times6\times5}{1\times2\times3\times4}(2^4)\left(\frac{3x}{2}\right)^4$

$5670(x^4)$

5

$\frac{3\sqrt{3}-5}{\sqrt{3}-2} \times \frac{\sqrt{3}+2}{\sqrt{3}+2}$

$= \frac{-1+\sqrt{3}}{-1}$

$= 1 - \sqrt{3}$

Half Term 2B (ANSWERS)	Week 7

1

$Repeated\ root\ b^2 - 4ac = 0$

$(k+5)^2 - 4 \times k \times k = 0$

$k^2 + 10k + 25 - 4k^2 = 0$

$-3k^2 + 10k + 25 = 0$

$3k^2 - 10k - 25 = 0$

$(k-5)(3k+5) = 0$

$k = 5 \quad k = -\frac{5}{3}$

2

$No\ real\ roots \quad b^2 - 4ac < 0$

$(8-4p)^2 - 4 \times 4 \times (8-7p) < 0$

$64 - 64p + 16p^2 - 128 + 112p < 0$

$16p^2 + 48p - 64 < 0$

$4(p-1)(p-4) < 0$

$1 < p < 4$

3

$4y = -3x + 5$

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

$(y - 4) = -\frac{3}{4}(x + 4)$

$4y - 16 = -3x - 12$

$3x + 4y = 4$

4

$\frac{12\times11\times10\times9\times8}{1\times2\times3\times4\times5}\left(\frac{1}{2}\right)^7 (-2x)^5$

$-198(x^5)$

5

$3\sqrt[3]{3} - \sqrt[3]{3} + 9\sqrt[3]{3} = 11\sqrt[3]{3}$