

Grade 9 Skills Review

Answer key Final answers only. Try first, then check.

CORE SKILLS

K1 a) $m = -\frac{3}{4}$
 b) $y = -\frac{3}{2}x + \frac{13}{2}$
 c) $y = \frac{3}{2}x - 1$

K2 a) $y = \frac{3}{4}x + 2$
 b) x -intercept 4; y -intercept -10
 c) $3x + y - 1 = 0$

K3 a) $-6x^3 + 15x^2 - 12x$
 b) $3x - 5$
 c) $-x^2 + 16x - 3$

K4 a) $x^2 - 2x - 24$
 b) $9x^2 - 12x + 4$
 c) $-x^2 + 12x + 13$

K5 a) $\sqrt{117} \approx 10.8$ cm
 b) $x = 15$
 c) $x = 15$

REAL WORLD

A1 a) $V = 180 - 6t$; slope -6 : the barrel loses 6 L per minute; V -intercept 180: it holds 180 L when full, at $t = 0$
 b) 17.5 min
 c) 0 L: the barrel is empty at $t = 30$ min, so the equation only holds for $0 \leq t \leq 30$.

A2 a) $\sqrt{40.81} \approx 6.39$ m
 b) $d \approx 1.58$ m; height ≈ 6.31 m
 c) No: following the guideline, the ladder reaches only about 6.31 m. Reaching 6.35 m needs the foot about 1.39 m from the wall, closer than the 1.59 m the guideline requires.

A3 a) 1.85 km
 b) 1.875 km (the map distance is 7.5 cm)
 c) 14.8 cm; 3.7 km, double the true 1.85 km; the true scale of the copy is 1 : 12 500.

THINK IT THROUGH

T1 a) 3 and 81: the two expressions are not equal, so the expansion is wrong.
 b) 1. The 3 was moved inside the bracket before squaring, so it got squared: $(3x - 12)^2 = 9(x - 4)^2$. 2. The binomial was squared term by term, losing the middle term: $(3x - 12)^2 = 9x^2 - 72x + 144$.
 c) $3x^2 - 24x + 48$; at $x = 5$: $75 - 120 + 48 = 3$

T2 a) e.g. $x = 3$: it never meets the y -axis; its slope is undefined. ($x = 0$ also works: it meets the y -axis everywhere.)
 b) $y = \frac{1}{2}x + 3$
 c) $2x + 5y - 8 = 0$

BOSS LEVEL

Boss a) $ab = 60$
 b) $a^2 + b^2 = 289 - 120 = 169$, so $c = 13$ cm
 c) $(a - b)^2 = 49$; the legs are 12 cm and 5 cm

