

Name _____

Date _____

VERTEXMATH • BUILD YOUR OWN • MTH1W GRADE 9

Linear Relations: your summary

1 Fill in every blank from memory. No notes.**2** Check it against the Unit Summary in a different colour.**3** Tick ✓ or X on each card. Every X is a topic to review.vertexmath.ca
Worksheet, answers &
this cheat sheet

Equation of a line: first step

Write the tool for each case.

(2, 7) and (5, 1)

 $m = 3, (1, -4)$ $\parallel$ or $\perp$ to $y = 2x + 1$

1 First differences

☒ ☒**1** How do first differences show a relation is linear? What changes when the x -steps are unequal?**2** x : 0, 5, 10, 15; y : 8, 23, 38, 53. Linear? Write its equation.

2 Direct or partial?

☒ ☒**3** Direct or partial: $y = 7x$ and $y = 7x - 5$? How can you tell?**4** A gym charges a \$35 joining fee plus \$18 a visit. Write the equation. Direct or partial?

3 Slope

☒ ☒**5** Write the slope formula. Find the slope through $(-4, -3)$ and $(2, 9)$.**6** Slope of $y = -6$? Slope of $x = 8$?**7** The y -axis is marked in 5s, the x -axis in 1 s. A line rises one square per square across. Its slope?

4 $y = mx + b$

☒ ☒**8** State m and b for $y = 9 - 4x$ and for $5y = 10x + 15$.**9** Slope $-3/4$, y -intercept 2: list three points on the line.

5 Equation of a line

☒ ☒**10** Find the equation through $(-3, -8)$ and $(2, 7)$.**11** Slope -2 through $(5, -4)$: find the equation.**12** Write $4x + 3y = 21$ in the form $y = mx + b$.

6 Parallel and perpendicular

☒ ☒**13** Give the parallel and perpendicular slopes for $m = -5/7$.**14** Find the line perpendicular to $y = -2x + 9$ through $(6, -1)$.

7 Linear inequalities

☒ ☒**15** Graph $y \geq -x + 5$: solid or dashed? Which side is shaded?**16** Write $2x - 8y > 16$ in the form $y \dots$

8 Linear models

☒ ☒**17** A canoe rental costs \$18 plus \$14 per hour. Write the equation. What do the slope and b mean?**18** A pool drains by $V = 5000 - 250t$ litres. For which t does the model make sense?

My traps Your three most likely mistakes, and how you will catch each one.

1 _____ **2** _____ **3** _____

Answers • Answers to the numbered prompts. Cover this strip until you are done.

1 Constant differences for equal x -steps; otherwise compare $\Delta y \div \Delta x$ for each pair

2 Differences 15, step 5: rate 3; $y = 3x + 8$

3 Direct ($b = 0$); partial ($b = -5$)

4 $C = 18v + 35$; partial

5 $m = (y_2 - y_1)/(x_2 - x_1)$; $12/6 = 2$

6 0; undefined

7 $m = 5$, not 1: read the axis numbers, never count squares

8 $m = -4$, $b = 9$; $y = 2x + 3$; $m = 2$, $b = 3$

9 $(0, 2)$, $(4, -1)$, $(8, -4)$

10 $m = 15/5 = 3$; $y = 3x + 1$

11 $-4 = -10 + b$; $b = 6$; $y = -2x + 6$

12 $y = -4x/3 + 7$

13 $-5/7$; $7/5$

14 $m = 1/2$; $y = x/2 - 4$

15 Solid; above ($0 \geq 5$ is false, so $(0, 0)$ is not shaded)

16 $y > x/4 - 2$

17 $C = 14h + 18$; \$14 per hour, \$18 fixed fee

18 $0 \leq t \leq 20$