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Monique Miotto Tracey MacBeth-Dunn

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Skill sheet

Linear equations 1

Due date:/...../...../ Name: Circle the linear equation. 4(m-3) - 2(m+1) = 99 [Solve 1 [Linear **A** 1-5x=3 **B** x(x+1)=10equation] brackets] **C** $4x + 2x^2 = 4$ **D** $\sqrt{d} = 8$ 10 5y - 6 = 9 + 2yFor **2–4**, is x = -3 a solution? [Solve pronumeral 7 - 2x = 132 both sides] [Substitution: checking solution] 11 [Solve pronumeral $\frac{4(3x-2)+2}{5} = 6$ both sid **3** [Substitution: checking 4(p+7) = 20 - 2(p-1)solution] complex] 13 - 4x = 3 - 2(2x - 5)4 Substitution: $7 = \frac{m}{2} - 4$ checking 13 [Solve 2 step] solution] For 5–21, solve for the unknown $7 = \frac{m-4}{2}$ 14 [Solve 2 step] 5 [Solve 2 step] 3x + 2 = -106 6 - 4y = 8[Solve 2 step] $\frac{4-3x}{6} = -1$ 15 [Solve 3 step] 3(t+7) = 337 [Solve brackets] $\frac{3m}{7} - 2 = 7$ 16 [Solve $\frac{5k}{4} = -10$ 3 step] 8 [Solve 2 step]

17 [Solve complex]	$\frac{5(3-x)}{2} = 1\frac{1}{2}$	25 [Substitution formula: solve]	If $A = \frac{h(a+b)}{2}$, find b if $A = 38.1$, $h = 6$ and $a = 4.8$.
18 [Solve fraction]	$\frac{x}{4} - \frac{x}{5} = 2$	For 26–27 , length (2 <i>x</i>	a rectangle with a perimeter of 31 cm has $+ 3 \text{ cm}$ and width $(5 + x) \text{ cm}$.
19 [Solve fraction]	$\frac{4p}{5} = \frac{3p-1}{2}$	26 [Write equation from words]	Write an equation to represent this information.
20 [Solve fraction]	$\frac{a}{2} = \frac{a-1}{6} + \frac{2}{3}$	27 [Substitution formula: solve]	Solve the equation. Hence, calculate the length of the rectangle.
21 [Substitution formula: solve]	If $y = 3x + 10$, find x if $y = -2$.	temperature degrees Fa find degree the degree by nine.	res measured in degrees Celsius (C) and hrenheit (F). Her teacher tells her that to es Celsius(C) you multiply 32 less than s Fahrenheit (F) by five and divide it all
22 [Substitution formula: solve]	If $\frac{PrT}{100}$, find <i>P</i> if <i>I</i> = 2500, <i>r</i> = 5 and <i>T</i> = 4.	28 [Write equation from words]	Write an equation to represent this.
23 [Substitution	If $\frac{PrT}{100}$, find <i>T</i> if <i>I</i> = 360, <i>P</i> = 8000 and	29 [Substitution formula: solve]	Use the equation in 28 to convert 77°F to °C.
formula: solvej	<i>I</i> = 5.	30 [Substitution formula: solve	Use the equation in 28 to convert 100°C to °F.
24 [Substitution formula: solve]	If $C = 2\pi r$, find <i>r</i> if $C = 23.5$. Answer correct to 1 decimal place.		

Student comment	Guardian comment/signature	Teacher feedback

Linear equations 2



Skill sheet

18 Solve: $-7(g-3) > 56$ [Inequation: solve bracket]	25 Write an inequation to represent this information. Let L be the length of the room.
19 $5m-17 \ge 3m-4$ [Inequation: solve pronumerals both sides] $$	26 Solve the inequation and answer [Inequation: application]
20 Solve: $14 - 9j > 3j + 2$ [Inequation: solve pronumerals hoth sides]	For 27–28 , Rylee got 81 and 86 in her first two maths tests. She has one test left. She wants to know what marks she could get on the last test to have an average mark of at least 85.
$\begin{array}{c} \textbf{21} \\ [Inequation: \\ solve complex] \end{array} 4(2a-3) < 5 - (4-3a) \\ \hline \end{array}$	27 Write an inequation to represent this information. Let <i>m</i> be her mark in the last test.
22 $\boxed{[Inequation: solve complex]} \frac{3p-8}{2} \ge 3(p-1) - 4(3-p)$	28 Solve the inequation and answer her question.
23 $a_{\overline{5}} - \frac{2a+3}{2} \ge -3$ [Inequation: solve complex]	For 29–30 , a taxi company charges a flagfall of \$2.80 and then \$2 per km. Sarah wants to know how far she can travel when she wants to spend no more than \$15 on a taxi fare
24Write an inequation to represent the following situation:word problems]Five more than twice a number is at most 35.	29 Let <i>x</i> be the number of kilometre travelled. Write an inequation that represents this situation.
For 25–26 , Peter has a rectangular lounge room with a width of 5 m. He knows the area is at least 36 m^2 and wants to know what the smallest length is that the room could have.	30 Solve the inequation and answer her question.

Student comment	Guardian comment/signature	Teacher feedback

Linear equations 3

Due date:/..../...../ Name: Is x = 4 a solution to 2x + 6 = 8 + 3(x - 2)? Solve the simultaneous equations 6 [Substitution: [Graphical y = -2x + 3 and y = x - 3 graphically. checkina solution] solution] Is the coordinate pair (2, -6) a solution 2 [Substitution: to the simultaneous equations checking = x - 37x + 2y = 2 and 2x + 3y = -14? Show solution] your working. -2xv =3 Which coordinate pair is the solution to [Substitution: the simultaneous equations 5x - y = 11checking and 3x - 7y = -19? For 7–12, add or subtract the equations, then solve solution] to find *x* or *y*. Α (2, 2)3x + 2y = -6[1] 7 (4, 9)В Add 2x - 2y = 16[2] С (3, 4) equations] D (-3, 2)8 -3x + 4y = 5[1] For 4–5, refer to the following graph of y 4 and [Add 3x - 2y = 7[2] y = -2x - 2. equations] 7x + 5y = 18[1] 9 [Subtract 7x + 2y = 3[2] equations] -3x + 5y = -10[1] 10 [Subtract 2x + 5y = -5[2] equations] Multiply 2x + 5y = 7 by 3. 11 [Multiply equations] = -2x - 2Multiply x - 3y = 5 by -4. 12 [Multiply Find the coordinates of the point of equations] [Point of intersection. For 13–15, use the simultaneous equations intersection] 5x + 2y = 2 and 3x - 2y = 30. Hence solve the simultaneous equations Solve the equations for *x* using the 13 [Graphical y = x + 4 and y = -2x - 2. [Elimination elimination method. solution] method] Using the value of x from 13, find the 14 [Elimination value of y. method]

15 [Substitution: checking solution]	State the solution to the simultaneous equations. Substitute the solution into the two original equations to check it is correct. Show working.	23 $x = 2y + 4$ [1] [Substitution $3x + 4y = 17$ [2] method]
		24 $y = -3x + 4$ [1] [Substitution $2x - 3y = 10$ [2] method] $2x - 3y = 10$ [2]
For 16–18 , the elimina	solve the simultaneous equations using ation method.	For 25–26 , Sam and Will buy their mate's lunch. Sam buys three hamburgers and four drinks and pays
16 [Elimination method]	2x - 5y = -7 [1]2x + 2y = 14 [2]	\$28, whilst Will buys two hamburgers and three drinks and pays \$19.50. (Use <i>H</i> for hamburger and <i>D</i> for drink.)
17 [Elimination method]	2x + 4y = 16 [1] 3x + 2y = 12[2]	25 Write simultaneous equations to represent both Sam and Will's situations.
18 [Elimination method]	4x + 3y = 3 [1]-3x - 2y = -1 [2]	26 Solve the simultaneous equations to find the cost of a hamburger and of a drink.
For 19–21 ,	use the simultaneous equations $y = 4x - 3$	For 27–28 , Tom buys two CDs and three DVDs for \$39. Kate buys three CDs and six DVDs for \$72.
19 [Substitution method]	Solve the equations for x using the substitution method.	27Write simultaneous equations to describe this situation. Let c be the number of CDs and d the number of DVDs.
20 [Substitution method]	Using the value of <i>x</i> from 19 , find the value of <i>y</i> .	28 Solve the simultaneous equations and find the cost of one DVD.
21 [Substitution: checking solution]	State the solution to the simultaneous equations. Substitute the solution into the two original equations to check it is correct. Show working.	application] For 29–30 , for two numbers, <i>a</i> and <i>b</i> , we know that seven less than twice the first number is the same as triple the second number, and the sum of the two numbers is 16.
	-5	29 Write simultaneous equations to describe this information.
For 22–24 ,	solve the simultaneous equations using	application] Find the value of the two numbers. Simultaneous equation
the substit 22 [Substitution method]	ution method. y = 3x - 4 [1] 4x + y = 24 [2]	application]

Student comment	Guardian comment/signature	Teacher feedback

Investigation

Moving around

Is a distance of <i>d</i> kilometres in <i>t</i> hours has an average es per hour (km/h). The relationship between average and time is $s = \frac{d}{t}$. rides his motorbike for a distance of 160 kilometres and is his average speed? ranspose the formula $s = \frac{d}{t}$ to make <i>d</i> the subject Spike rides at an average speed of 92 km/h for three and e travel? ranspose the formula to make <i>t</i> the subject, spike travels 615 kilometres at a speed of 75 kilometres urney take him? likes going to the beach. me weekend, he rides to Shelly beach and the 170.2 km j pllowing weekend, he rides to Boney beach. It takes him	<take 07007="" in=""></take>
rides his motorbike for a distance of 160 kilometres and is his average speed?	the journey takes him 2 hours, d a half hours, what distance would s per hour how long would the
ranspose the formula $s = \frac{d}{t}$ to make <i>d</i> the subject Spike rides at an average speed of 92 km/h for three and the travel? ranspose the formula to make <i>t</i> the subject Spike travels 615 kilometres at a speed of 75 kilometres purney take him? likes going to the beach. one weekend, he rides to Shelly beach and the 170.2 km j pllowing weekend, he rides to Boney beach. It takes him	d a half hours, what distance would s per hour how long would the journey takes him 2.3 hours. The
Spike rides at an average speed of 92 km/h for three and e travel?	d a half hours, what distance would s per hour how long would the journey takes him 2.3 hours. The
ranspose the formula to make <i>t</i> the subject	s per hour how long would the
Spike travels 615 kilometres at a speed of 75 kilometres ourney take him? likes going to the beach. ne weekend, he rides to Shelly beach and the 170.2 km j llowing weekend, he rides to Boney beach. It takes him	s per hour how long would the
likes going to the beach. ne weekend, he rides to Shelly beach and the 170.2 km j llowing weekend, he rides to Boney beach. It takes him	journey takes him 2.3 hours. The
ne weekend, he rides to Shelly beach and the 170.2 km j blowing weekend, he rides to Boney beach. It takes him	ourney takes him 2.3 hours. The
om home to Boney beach. On which trip was he travelli	3.5 hours to travel the 259.7 km ing the fastest and by how much?
pike's average speed on the way home from Boney beac beed on his way there.	ch was 5 km/h less than his average
id the return journey from Boney beach take him more here? Why?	or less time than the journey
is holiday, Spike travels to a beach interstate. On the way /h and on the way home he averages 80 km/h. The return	y there he averages a speed of n trip takes him 12.3 hours.
In the trip there Spike takes t hours. Write an expression $f t$.	for the distance travelled in terms
<no answer="" be<="" come?="" copy="" has="" is="" question="" supplied.="" td="" to=""><td>en supplied.>></td></no>	en supplied.>>
he distances travelled to and from the interstate destinanswers to a and b and solve to find the time taken on the	tion are the same. Equate your e way there.
	is holiday, Spike travels to a beach interstate. On the wa /h and on the way home he averages 80 km/h. The retur n the trip there Spike takes <i>t</i> hours. Write an expression <i>t</i> <no answer="" be<br="" come?="" copy="" has="" is="" question="" supplied.="" to="">he distances travelled to and from the interstate destina nswers to a and b and solve to find the time taken on the</no>

When Spike was away on this beach holiday he made friends with Jenna, who was also there on holiday. They want to meet on the long weekend but they live 450 km apart so they decide to meet at some point between their two homes. At 6 am on Saturday they each leave home and head in opposite directions with Jenna riding at 70 km/h and Spike riding at 80 km/h. How long after they reach home will they meet?

To determine this, we organise information into a table.

	d	S	t
Spike	x	80	t
Jenna	450 - x	70	t
Total	450	_	_

a Why it *t* the same for both Spike and Jenna.

6 IUse a

formula]

- **b** If the distance travelled by Spike is x, why is the distance travelled by Jenna 450 x?
- **c** Using the distance and speed for Spike, find an expression in terms of *x* for the time taken for his part of the journey.
- **d** Using the distance and speed for Jenna, find an expression in terms of *x* for the time taken for her part of the journey.
- e Since the time taken by each of them is the same, equate the expressions from parts c and d and solve for x.
- **f** What does this solution tell you?
- **g** Substitute the value of x into your expression from part **c**.
- **h** What does this answer represent?
- i Would you expect to get the same result if you substituted the value of x into the expression obtained in part d? Why?

Student comment	Guardian comment/signature	Teacher feedback

Name:

Technology task—ClassPad

Solving simultaneous equations

Due date:/...../...../...../





5	Using the Solve command, try to solve $6x - 3y = 9$ and $2x - y = 3$. Then make y the subject in each of the equations. What do you notice? What is the solution to this pair of simultaneous equations?
6	Using the Solve command, try to solve $y = x^2 + 2$ and $y = 1$. Then graph the equations. What do you observe? Is there a solution?
7	For each of the following, graph the equations and find the number of points of intersection. Then use the Solve function to find or verify the solution(s).
	a $y = x^2 + 2$ and $y = 2x + 1$
	b $y = x^2 + 2$ and $y = x + 4$

For each of the following, use the Solve function to determine the solutions (correct [If the graph Try this! window is not to 2 decimal places). Then graph the pair of equations. Hence explain the number suitable for of solutions. locating the point of intersection, tap **Zoom** then Zoom Out.] [After typing **a** $y = x^3 + 3x^2 - x - 5$ and y = 2x + 1. x^3 , press \triangleright to 'escape' from the index **b** $y = x^3 + 3x^2 - x - 5$ and y = 6. position.] [When reading the solution, Gh press > to see all of the answers.] RER SAM

Student comment	Guardian comment/signature	Teacher feedback

Name:

Technology task—TI-Nspire

Solving simultaneous equations

Due date:/...../...../...../





Although it is usually more convenient to use the **Solve** function for simultaneous equations, 4 [It is often there are times when graphing is necessary! Try to use the **Solve** function for 2x - 4y = 7 and useful to 3x - 6y = 1. What happens? Now make y the subject of each equation and graph them as before. adapt a Is there a solution to these simultaneous equations? previous Solve command. Press 🔺 to highlight the command and press (enter), then edit as required.] Using the **Solve** command, try to solve 6x - 3y = 9 and 2x - y = 3. Then make y the subject in each 5 of the equations. What do you notice? What is the solution to this pair of simultaneous equations? Using the **Solve** command, try to solve $y = x^2 + 2$ and y = 1. Then graph the equations. What do 6 you observe? Is there a solution? RAD AUTO REAL 1.1 1.2 solvely +2 and y=1,x0/99 For each of the following, graph the equations and find the number of points of intersection. 7 Then use the **Solve** function to find or verify the solution(s). $y = x^2 + 2$ and y = 2x + 1а $y = x^2 + 2$ and y = x + 4h

Try this! [If the window is not large enough, press menout to select Zoom Out from the Window menu.]	For each of the following, use the Solve function to determine the solutions (correct to 2 decimal places). Then graph the pair of equations. Hence explain the number of solutions.
[After typing x ³ , press ▶ to 'escape' from the index position.]	a $y = x^3 + 3x^2 - x - 5$ and $y = 2x + 1$. b $y = x^3 + 3x^2 - x - 5$ and $y = 6$.
[When reading the solution, press ▶ to see all of the answers.]	
	S

Student comment	Guardian comment/signature	Teacher feedback