

Using the TI-30XS MultiView Calculator

A Hands-On Workshop for HiSET & GED Math

Facilitator Guide + Student Practice + Quick-Reference Card

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About this workshop

The TI-30XS MultiView is the calculator used for the GED® Mathematical Reasoning test. For HiSET® Mathematics, the test center provides the calculator; test takers may not bring their own, and the exact model can vary by state or test site. This workshop uses the TI-30XS MultiView to build scientific-calculator skills that transfer to HiSET math practice.

Plan for about 90 minutes. You can teach it in one sitting or split it into shorter chunks — the parts are built to stand on their own.

This complete packet includes: the full workshop, free-response practice with an answer key, a set of HiSET-style multiple-choice questions, a button-by-button keystroke answer key, and a one-page quick-reference card to copy for students.

Facilitator Overview

Who this is for

Adult education students preparing for the HiSET or GED math test. No prior calculator experience assumed. Works for a full class or one-on-one tutoring.

Learning goals

By the end of the workshop, students will be able to:

- Turn the calculator on, clear it, and fix entry mistakes
- Enter problems the way they are written, including parentheses and order of operations
- Tell the difference between the subtraction key and the negative key (the #1 cause of wrong answers)
- Work with fractions and switch between fraction and decimal answers
- Use squares, exponents, square roots, percents, and pi
- Find any function printed above a key using the 2nd key

What you need

- One TI-30XS MultiView per student (or the on-screen version if practicing on computers)
- Printed copies of the Student Practice pages and the Quick-Reference Card (last two sections)
- A board or screen to model keystrokes — or a document camera pointed at your own calculator

How to run it

Teach one section, then have students do the matching guided example with you — everyone presses the keys at the same time. Walk the room. The single most common problem you will see is students using the wrong negative key, so call that out early and often.

Teaching tip

Tell students up front: “You do not have to do the math in your head. You have to know which buttons to press.” That reframing takes pressure off and is exactly the skill the test rewards.

Part 1 — Meet Your Calculator

The display

The TI-30XS MultiView shows up to four lines at once. The big advantage: it shows the problem the way it is written on paper. If you type a fraction, you see a fraction stacked top-and-bottom — not a decimal. What you type stays on the top line; the answer appears on the right.

The keys you must know first

Before any math, students need these five. Spend real time here.

Press	What it does
on	Turns the calculator on. (It is the bottom-left key.)
2nd off	Press 2nd, then ON, to turn the calculator off. Automatic Power Down turns it off after about 5 minutes of inactivity. The display clears, but history, settings, and memory are retained.
clear	Clears the current line. Press it to clear the current entry line. Use the RESET command only when you intentionally want to clear history, settings, and memory.
enter	Calculates the answer. This is the “equals” button.
del	Deletes one character — like a backspace. Use this to fix a typo without starting over.

The two keys that unlock everything else

Press	What it does
2nd	Many keys have a second label printed in color ABOVE the key. Press 2nd first, then that key, to use the printed-above function. (For example, the square-root function lives above the x^2 key.)
arrows	The round pad of arrow keys moves your cursor around the screen — up, down, left, right. You use it to move between the top and bottom of a fraction, or to go back and fix part of a problem.

Say this to your class

“If you ever see a button you need but it is printed in color above a key, that means: press 2nd first, then the key. The 2nd key is your magic key.”

Part 2 — The Basics

Doing simple math

Type the problem left to right, exactly as you would read it, then press enter.

Do this	Press	You should see
Add 48 and 26	4 8 + 2 6 enter	74
Multiply 13 by 7	1 3 $\times$ 7 enter	91
Divide 144 by 12	1 4 4 $\div$ 1 2 enter	12

Order of operations — use parentheses

The calculator follows the math order of operations (multiply and divide before add and subtract). When a problem groups numbers together, put them in parentheses so the calculator groups them the same way you do.

Example: **(5 + 3) $\times$ 4**. Without parentheses, the calculator would multiply 3×4 first and give the wrong answer.

Do this	Press	You should see
Open a parenthesis	(	(
Enter 5 + 3	5 + 3	(5+3
Close it, times 4	) $\times$ 4 enter	32

THE big one: negative numbers

Most important thing in this whole workshop

There are **TWO** keys that look like a minus. They are not the same:

- The subtraction key marked $-$ means SUBTRACT — it goes between two numbers.
- The $(-)$ key on the bottom row means NEGATIVE — it goes in front of a single number.

If you use the wrong one, you get an error or a wrong answer. This trips up almost everyone.

To enter negative 8, you press the $(-)$ key, then 8. To do 5 minus 8, you press 5, then the subtract key, then 8.

Do this	Press	You should see
Enter -8 plus 3	$(-)$ 8 + 3 enter	-5
Do 5 minus 8	5 $-$ 8 enter	-3

Do this	Press	You should see
Multiply -4 by -6	$(-) 4 \times (-) 6$ enter	24

Fixing mistakes

- **del** deletes the character to the left of the cursor (backspace).
- **clear** wipes the current line so you can start the problem over.
- Use the **arrows** to move back into a problem and change just one number instead of retyping everything.

Part 3 — Fractions

Fractions show up all over the HiSET and GED. This calculator handles them beautifully because it shows a real stacked fraction, not a decimal.

Entering a fraction

Find the fraction key **n/d** (it shows a little box over a box). Press it, type the top number, press the **down arrow** to drop to the bottom, then type the bottom number.

Do this	Press	You should see
Start a fraction	n/d	empty fraction template
Type the top (3)	3	3 in numerator
Drop to the bottom	▼	cursor in denominator
Type the bottom (4)	4	3/4

Adding fractions

Enter the first fraction, press the add key, enter the second fraction, then press enter. Use the right arrow to step out of the bottom of a fraction before typing the + sign.

Example: $1/2 + 1/3$ — enter $1/2$, arrow right to leave the fraction, press +, enter $1/3$, press enter. Answer shows as $5/6$.

Mixed numbers

For a mixed number such as $2 \frac{1}{2}$, enter the whole-number part first. Then press 2nd + n/d (the Un/d function), enter the numerator, press ▼, and enter the denominator. Example: 2 2nd+n/d 1 ▼ 2 ENTER.

The toggle key: fraction ↔ decimal

A student favorite

Use the direct Answer Toggle key immediately above ENTER to switch an exact result and its decimal approximation. For example, if the answer is $3/4$, press Answer Toggle to see 0.75; press it again to return to the exact form.

This is huge on the test — if the answer choices are decimals but your answer came out as a fraction, one button gives you the matching form.

Part 4 — Powers, Roots & Pi

Squaring a number

Type the number, then press the x^2 key, then enter. Example: 9 squared.

Do this	Press	You should see
Square 9	9 x^2 enter	81

Any exponent (powers)

Use the $\wedge$ key (the “caret”) for any power. Type the base, press $\wedge$, type the exponent, press enter.

Do this	Press	You should see
2 to the 5th power	2 $\wedge$ 5 enter	32

Square roots

The square-root symbol is printed ABOVE the x^2 key, so press **2nd** then x^2 . Type the number inside, then enter.

Do this	Press	You should see
Square root of 64	2nd x^2 6 4 enter	8

Pi

The π key is a direct key on the TI-30XS MultiView. Press π to enter pi. The calculator keeps an exact π result when possible; use the answer-toggle key to view a decimal approximation.

Part 5 — Percents

Percent problems are everywhere on the test — tips, discounts, interest, tax. There are two reliable ways to handle them.

Way 1: Turn the percent into a decimal

Move the decimal point two places left in your head: 20% becomes 0.20. Then multiply.

Do this	Press	You should see
What is 20% of 150?	0 . 2 0 $\times$ 1 5 0 enter	30

Way 2: Use the percent function

The % function is printed above the right-parenthesis key. Enter the percent value first, then press 2nd +) to append %. Example: 20 2nd+) $\times$ 150 ENTER gives 30.

Plain-English percent reminders

- “Of” almost always means multiply.
- To find a percent of a number, change the percent to a decimal and multiply.
- For a discount: find the discount amount, then subtract it from the original price.
- For a tip or tax: find the percent amount, then add it on.

Part 6 — Test-Day Notes

GED vs. HiSET

- GED: The TI-30XS MultiView is available as an on-screen calculator on the calculator-allowed portion of Mathematical Reasoning. Under current GED policy, a personal TI-30XS may also be used at a test center. Check current GED rules before test day.
- HiSET: The Mathematics test is calculator-neutral. The test center provides a four-function or scientific calculator; test takers may not bring their own calculator. State or test-site policies can affect the exact calculator provided, so students should check current local rules before test day.

The mistakes that cost points

1. Using the subtract key instead of the (-) negative key (or the other way around).
2. Forgetting parentheses around grouped numbers, so the order of operations comes out wrong.
3. Leaving an old number on the screen — clear between problems.
4. Reading a fraction answer when the test wants a decimal. Use the toggle key to match the form of the answer choices.

Confidence builder

Remind students that the calculator is a tool, not a crutch they should fear. The students who do best are simply the ones who practiced until the buttons felt familiar. That is the entire point of this workshop.

Student Practice

Use your calculator for every problem. Write the answer in the blank. Check your work against the answer key your instructor has.

Set A — Basics & negatives

1. $47 + 89 =$ _____
2. $312 \div 8 =$ _____
3. $(7 + 5) \times 6 =$ _____
4. $-15 + 9 =$ _____
5. $-6 \times -7 =$ _____
6. $20 - 35 =$ _____

Set B — Fractions

1. $1/4 + 1/2 =$ _____
2. $3/5 - 1/5 =$ _____
3. $2/3 \times 3/4 =$ _____
4. Write $5/8$ as a decimal (use the toggle key) = _____
5. Write 0.6 as a fraction (use the toggle key) = _____

Set C — Powers, roots & percents

1. $12^2 =$ _____
2. 3 to the 4th power = _____
3. Square root of 121 = _____
4. What is 15% of 80? = _____
5. A \$60 jacket is 25% off. What is the discount in dollars? = _____
6. A \$40 meal with a 20% tip — what is the total? = _____

Answer Key (Instructor)

Set A

1. 136
2. 39
3. 72
4. -6
5. 42
6. -15

Set B

1. $\frac{3}{4}$
2. $\frac{2}{5}$
3. $\frac{1}{2}$
4. 0.625
5. $\frac{3}{5}$

Set C

1. 144
2. 81
3. 11
4. 12
5. \$15.00 (discount); sale price would be \$45.00
6. \$48.00 (\$40 meal + \$8 tip)

HiSET-Style Practice Questions

These follow the HiSET Mathematics format — each question has five answer choices (A–E), and every one rewards using your calculator. Circle the best answer. The instructor answer key follows, with the keystrokes for each.

1. Evaluate: $5 + 3 \times (12 - 4)$
 - A. 24
 - B. 29
 - C. 37
 - D. 64
 - E. 96
2. At 6 a.m. the temperature was -4°F . By noon it had risen 19 degrees. By 9 p.m. it had dropped 12 degrees from the noon temperature. What was the temperature at 9 p.m.?
 - A. 35°F
 - B. 27°F
 - C. 15°F
 - D. 11°F
 - E. 3°F
3. A recipe needs $\frac{2}{3}$ cup of flour for the dough and $\frac{3}{4}$ cup for the topping. How much flour is needed in all?
 - A. $\frac{5}{7}$ cup
 - B. $1\frac{1}{12}$ cups
 - C. $1\frac{5}{12}$ cups
 - D. $1\frac{7}{12}$ cups
 - E. $\frac{5}{12}$ cup
4. Which decimal is equal to $\frac{5}{8}$?
 - A. 0.58
 - B. 0.625
 - C. 0.8
 - D. 1.6
 - E. 0.0625
5. A square garden has sides of 14 feet. What is the area of the garden, in square feet? (Area = side²)
 - A. 28
 - B. 56

-
- C. 144**
D. 169
E. 196
6. A square floor tile has an area of 225 square inches. How long is each side of the tile?
(side = $\sqrt{\text{area}}$)
- A. 14.5 in**
B. 15 in
C. 25 in
D. 45 in
E. 112.5 in
7. A circular tabletop has a radius of 3 feet. What is its area, to the nearest tenth of a square foot? (Area = πr^2)
- A. 9.4**
B. 18.8
C. 28.3
D. 56.5
E. 113.1
8. A store sold 480 phones last month. This month, sales increased by 15%. How many phones did the store sell this month?
- A. 72**
B. 408
C. 495
D. 552
E. 720
9. A jacket originally priced at \$85 is on sale for 30% off. What is the sale price?
- A. \$25.50**
B. \$55.00
C. \$76.50
D. \$59.50
E. \$110.50
10. A dinner bill is \$46.00. A 20% tip is added. What is the total amount paid?
- A. \$9.20**
B. \$55.20
C. \$36.80

D. \$57.50

E. \$66.00

11. A car traveled 297 miles using 11 gallons of gas. How many miles per gallon did it get?

A. 2.7

B. 26

C. 27

D. 286

E. 308

12. A student earned these five test scores: 78, 85, 92, 67, and 88. What is the mean (average) of the scores?

A. 81

B. 82

C. 85

D. 88

E. 410

HiSET-Style Practice — Answer Key (Instructor)

Correct answer, then the calculator path that gets there.

1. **B (29)** — Use parentheses: $(12 - 4) = 8$, then $5 + 3 \times 8$. The calculator follows order of operations and returns 29. Choice D (64) is what you get if you wrongly group it as $(5+3) \times (12-4)$.
2. **E (3°F)** — Watch the negative key: $(-) 4 + 19 = 15$, then $15 - 12 = 3$. Choice D (11) is the trap for anyone who forgets the starting temperature is negative.
3. **C (1 5/12 cups)** — Enter $2/3$ with the n/d key, arrow right, $+$, then $3/4$, ENTER. The result is $17/12$. To display $1\frac{5}{12}$, use $2^{nd} + x10^n$ (the n/d $\leftrightarrow$ Un/d conversion printed above the $x10^n$ key). The direct Answer Toggle is a different function; it switches exact and decimal forms.
4. **B (0.625)** — Enter the fraction $5/8$ and press the toggle key, or just divide $5 \div 8$. Choice D (1.6) is $8/5$ flipped upside down.
5. **E (196)** — 14 then the x^2 key, enter. Choice B (56) is the perimeter, not the area.
6. **B (15 in)** — 2^{nd} then x^2 for the square root, then 225, enter. Since $15 \times 15 = 225$, the side is 15.
7. **C (28.3 sq ft)** — $\pi \times 3 x^2$, enter (π is a direct key). That is $\pi \times 9 \approx 28.3$. Choice B (18.8) is the circumference, and E (113.1) happens if you square the diameter instead of the radius.
8. **D (552)** — $0.15 \times 480 = 72$, then $480 + 72 = 552$. Choice B (408) is what you get if you subtract instead of add.
9. **D (\$59.50)** — $0.30 \times 85 = 25.50$ (the discount), then $85 - 25.50 = 59.50$. Choice A (\$25.50) is just the discount amount, not the price.
10. **B (\$55.20)** — $0.20 \times 46 = 9.20$ (the tip), then $46 + 9.20 = 55.20$. Choice A (\$9.20) is the tip alone.
11. **C (27)** — $297 \div 11 = 27$. Choices D and E come from adding or subtracting instead of dividing.
12. **B (82)** — Add all five scores (410), then $\div 5 = 82$. Choice C (85) is the middle value, not the mean; choice E (410) is the sum without dividing.

Keystroke Answer Key — Button-by-Button Solutions

Same twelve questions as the HiSET-style practice, but here is every button to press, in order, from left to right. Press them just as written. Where the calculator shows the answer in a different form than the choices, the step to convert it is included.

The keys used below

Press	What it means
2nd	Press first to use the colored function printed ABOVE a key.
(-)	The NEGATIVE key. Goes in front of one number.
—	The blue SUBTRACT key. Goes between two numbers.
()	Parentheses. Group numbers to keep order of operations right.
x²	Squares a number.
2nd x²	Square root (the $\sqrt{}$ is above the x ² key).
^	Raises a number to any power.
n/d	Enter a fraction; use ▼ for denominator and ► to exit the template
▼ ►	Arrow keys — move inside a fraction and step out.
π	Pi, for circle problems.
◄	The toggle key (above ENTER) — switches fraction and decimal.
enter	Equals — gives the answer.

Question 1 Answer: 29 (Choice B)*Evaluate: $5 + 3 \times (12 - 4)$*

Press, in order:

5 + 3 × (1 2 − 4) enter

You'll see: 29

Note: The parentheses make the calculator do $12 - 4$ first, exactly the way the problem is written.**Question 2 Answer: 3°F (Choice E)***Start at -4° , rise 19, then drop 12.*

Press, in order:

(-) 4 + 1 9 − 1 2 enter

You'll see: 3

Note: Use the (-) key for the negative 4. Use the blue − key for “drop 12.” They are different keys.

Question 3 Answer: $1 \frac{5}{12}$ cups (Choice C)*Add the fractions: $\frac{2}{3} + \frac{3}{4}$*

Press, in order:

n/d 2 ▼ 3 ► + n/d 3 ▼ 4 enter

You'll see: 17/12

2nd + x10ⁿ (n/d ↔ Un/d)**Question 4 Answer: 0.625 (Choice B)***Write $\frac{5}{8}$ as a decimal.*

Press, in order:

5 ÷ 8 enter ◀▶

You'll see: 0.625

Note: If the screen shows the fraction $\frac{5}{8}$, the ◀▶ toggle key flips it to the decimal 0.625.

Question 5 Answer: 196 sq ft (Choice E)*Area of a square with sides of 14: 14^2*

Press, in order:

1 4 x² enter

You'll see: 196

Question 6 Answer: 15 in (Choice B)*Side of a square with area 225: $\sqrt{225}$*

Press, in order:

2nd x² 2 2 5 enter

You'll see: 15

Note: 2nd then x² gives the square-root sign. Type 225 inside it, then enter.**Question 7 Answer: 28.3 sq ft (Choice C)***Area of a circle, radius 3: $\pi \times 3^2$*

Press, in order:

 π $\times$ 3 x² enter ◀▶

You'll see: 28.27... → round to 28.3

Note: The calculator first shows the exact form (9π). Press the ◀▶ toggle key for the decimal, then round to the nearest tenth.**Question 8 Answer: 552 phones (Choice D)***480 phones, up 15%.*

Press, in order:

4 8 0 + 0 . 1 5 $\times$ 4 8 0 enter

You'll see: 552

Note: The calculator multiplies $0.15 \times 480 (=72)$ first, then adds it to 480. "15%" becomes 0.15.

Question 9 Answer: \$59.50 (Choice D)*\$85 jacket, 30% off.*

Press, in order:

8 5 − 0 . 3 0 × 8 5 enter

You'll see: 59.5 (= \$59.50)

Note: It finds the discount ($0.30 \times 85 = 25.50$) first, then subtracts it from 85.**Question 10 Answer: \$55.20 (Choice B)***\$46.00 bill, add a 20% tip.*

Press, in order:

4 6 + 0 . 2 0 × 4 6 enter

You'll see: 55.2 (= \$55.20)

Note: It finds the tip ($0.20 \times 46 = 9.20$) first, then adds it to the bill.**Question 11 Answer: 27 mpg (Choice C)***297 miles on 11 gallons: $297 \div 11$*

Press, in order:

2 9 7 ÷ 1 1 enter

You'll see: 27

Question 12 Answer: 82 (Choice B)*Mean of 78, 85, 92, 67, 88.*

Press, in order:

(7 8 + 8 5 + 9 2 + 6 7 + 8 8) ÷ 5 enter

You'll see: 82

Note: Put the whole sum in parentheses so the calculator divides the total by 5 — not just the last number.

Teaching reminder

The two minus keys cause more wrong answers than anything else. (-) means negative and goes in front of a single number; the blue − means subtract and goes between two numbers. Have students point to each key before they start.

TI-30XS MultiView — Quick-Reference Card

Cut along the line and keep it with your notes

Press	What it does
on / 2nd + on	Turn on / turn off
clear	Clear the current entry line
del	Backspace — delete one character
enter	Equals — get the answer
2nd	Use the colored function printed ABOVE a key
arrows	Move the cursor; move inside a fraction
()	Group numbers — keeps order of operations right
(-)	NEGATIVE number (goes in front of one number)
– (blue)	SUBTRACT (goes between two numbers)
n/d	Enter a fraction; use ▼ for denominator and ▶ to exit the template
2nd + n/d (Un/d) — enter the whole-number part first, then numerator ▼ denominator	Enter a mixed number
Answer Toggle (direct key above ENTER)	Switch exact/fraction result and decimal approximation
x²	Square a number
^	Any power / exponent
2nd then x²	Square root
π	Pi (for circle problems)
2nd +) (%)	Percent sign

Remember

Two minus keys are NOT the same. (-) means negative. The blue – means subtract. Mixing them up is the #1 mistake.

Part 7 — Algebra & Polynomials

What this calculator can—and cannot—do

The TI-30XS MultiView is very useful in algebra, but it is not a computer algebra system. It will not automatically combine like terms, factor a polynomial, or solve every equation for x . Students still need to choose the algebra steps.

It can do the arithmetic accurately after values are substituted, evaluate powers and roots, store numbers in variables, create a function table, and check whether an answer makes an equation true.

The right way to teach it

Do the algebra on paper. Use the calculator to evaluate, check, compare, and finish the arithmetic. This keeps students from guessing buttons while still giving them reliable support.

Algebra jobs the TI-30XS can help with

- Evaluate an expression when x , y , or another variable is given.
- Check a proposed solution to a linear equation or inequality.
- Create a table of values for a linear, quadratic, or polynomial function.
- Calculate powers, square roots, and values used in the quadratic formula.
- Check polynomial addition, subtraction, multiplication, and factoring by testing the same x -value in both forms.
- Estimate zeros by looking for table values where the output changes sign or becomes 0.

Important limitation

The calculator does not show algebraic steps. For example, it cannot turn $3x + 5x$ into $8x$ by itself. It can confirm the result after you choose a value for x .

Evaluating Algebraic Expressions

Method 1 — Substitute the value directly

Example: Evaluate $3x^2 - 4x + 7$ when $x = 5$.

Step	Press	Result
Replace x with 5	$3 \times 5 \times^2 - 4 \times 5 + 7$ enter	62
Use parentheses for a negative x	$3 \times (-) 2 \times^2 - 4 \times (-) 2 + 7$ enter	27

Why parentheses matter

When a negative value is raised to a power, enter the negative number inside parentheses. For example, $(-2)^2 = 4$, but -2^2 is interpreted as $-(2^2) = -4$.

Method 2 — Store a value in a variable

The calculator has memory variables. Storing a value is useful when the same value appears several times. Use $\text{STO} \rightarrow$ to store a value, then use the x y z t a b c variable key/menu to select the variable. The TI-30XS MultiView has seven memory variables: x, y, z, t, a, b, and c.

Do this	Typical key path
Store 5 in x	5 $\text{STO} \rightarrow$ x ENTER
Evaluate $3x^2 - 4x + 7$	$3 \times x \times^2 - 4 \times x + 7$ ENTER
Change x to -2	$(-) 2 \text{ STO} \rightarrow x$ ENTER; then evaluate the expression again

Guided examples

Expression	Given value	Calculator entry	Answer
$2x + 9$	$x = 6$	$2 \times 6 + 9$	21
$5a^2 - 3$	$a = 4$	$5 \times 4 \times^2 - 3$	77
$2m^3 + m$	$m = -3$	$2 \times ((-)3) \wedge 3 + (-)3$	-57
$(y + 4) \div 3$	$y = 11$	$(11 + 4) \div 3$	5

Function Tables

The function-table feature lets students enter a rule and see many input-output pairs. This is one of the strongest algebra features on the TI-30XS MultiView.

Set up a table

Step	What to do
1	Press TABLE.
2	Enter the rule, such as $2x + 3$. Insert x with the x y z t a b c variable key/menu, then press ENTER.
3	Enter the Start value and press $\blacktriangledown$. Enter the Step value and press $\blacktriangledown$. Choose Auto (or Ask- x), then press ENTER.
4	Use $\blacktriangle$ and $\blacktriangledown$ to move through the table.
5	Look for patterns, a zero output, or a sign change.

Example A — Linear function

For $f(x) = 2x + 3$, start at $x = -2$ and use a step of 1.

x	-2	-1	0	1	2
f(x)	-1	1	3	5	7

Example B — Quadratic function

For $f(x) = x^2 - 5x + 6$, start at $x = 0$ and use a step of 1.

x	0	1	2	3	4	5
f(x)	6	2	0	0	2	6

The outputs are 0 at $x = 2$ and $x = 3$, so the zeros are 2 and 3. This agrees with the factored form $(x - 2)(x - 3)$.

What a table can prove

A table can show that a particular input works and can help locate zeros. It does not replace algebraic proof, and a short table may miss a zero outside the selected range.

Polynomial Skills with Calculator Support

1. Identify the parts

In $4x^3 - 2x^2 + 7x - 5$, the terms are $4x^3$, $-2x^2$, $7x$, and -5 . The degree is 3 because 3 is the greatest exponent. The leading coefficient is 4.

2. Add and subtract polynomials on paper

Combine only like terms—terms with the same variable raised to the same power.

Problem	Paper work	Simplified result
$(3x^2 + 5x - 2) + (2x^2 - x + 7)$	$(3x^2+2x^2) + (5x-x) + (-2+7)$	$5x^2 + 4x + 5$
$(6x^2 - 3x + 4) - (2x^2 + 5x - 1)$	$6x^2-3x+4-2x^2-5x+1$	$4x^2 - 8x + 5$

3. Multiply polynomials on paper

Distribute every term, then combine like terms.

Problem	Expansion	Answer
$(x + 4)(x + 2)$	$x^2 + 2x + 4x + 8$	$x^2 + 6x + 8$
$(2x - 3)(x + 5)$	$2x^2 + 10x - 3x - 15$	$2x^2 + 7x - 15$
$(x + 3)^2$	$x^2 + 3x + 3x + 9$	$x^2 + 6x + 9$

4. Check equivalent forms with a test value

Choose an easy value such as $x = 2$. Evaluate the original form and the simplified form. Matching results are evidence that the work may be correct. One test value is a check—not a proof.

Check	Original form	Simplified form
$x = 2$ for $(x+4)(x+2)$	$(2+4)(2+2)=24$	$2^2+6(2)+8=24$
$x = -1$ for $5x^2+4x+5$	$5(-1)^2+4(-1)+5=6$	Same expression gives 6

Solving and Checking Equations

Linear equations

The TI-30XS does not isolate x automatically. Solve using inverse operations on paper, then use the calculator to check the answer.

Equation	Paper steps	Solution	Calculator check
$3x + 7 = 25$	$3x = 18$; $x = 6$	$x = 6$	$3 \times 6 + 7$ enter $\rightarrow$ 25
$5(x - 2) = 35$	$x - 2 = 7$; $x = 9$	$x = 9$	$5 \times (9 - 2)$ enter $\rightarrow$ 35
$4x - 3 = 2x + 11$	$2x = 14$; $x = 7$	$x = 7$	Both sides equal 25

Inequalities

Solve inequalities on paper. Remember: multiplying or dividing both sides by a negative number reverses the inequality sign.

Inequality	Steps	Answer	Check a value
$2x + 5 > 13$	$2x > 8$	$x > 4$	$x=5$: $15 > 13$ true
$-3x \leq 12$	divide by -3 and reverse $\leq$	$x \geq -4$	$x=-4$: $12 \leq 12$ true

Quadratic equations

The calculator can perform the arithmetic in the quadratic formula, but students must identify a , b , and c and enter the formula carefully.

For $ax^2 + bx + c = 0$, use $x = (-b \pm \sqrt{b^2 - 4ac}) \div (2a)$.

Two answers usually require two entries

Enter the formula once with $+$ before the square root and once with $-$. Use parentheses around the entire numerator and the entire denominator.

Quadratic Formula — Full Example

Solve $2x^2 + 3x - 2 = 0$. Here $a = 2$, $b = 3$, and $c = -2$.

Step 1 — Find the discriminant

$$b^2 - 4ac = 3^2 - 4(2)(-2) = 9 + 16 = 25.$$

Press

$3 \times^2 - 4 \times 2 \times (-2)$ enter

You should see

25

Step 2 — Use the plus sign

$$x = (-3 + \sqrt{25}) \div (2 \times 2) = (-3 + 5) \div 4 = 1/2.$$

Press

$((-) 3 + 2nd \times^2 2 5 \rightarrow) \div (2 \times 2)$
ENTER

Answer

1/2 or 0.5

Step 3 — Use the minus sign

$$x = (-3 - \sqrt{25}) \div (2 \times 2) = (-3 - 5) \div 4 = -2.$$

Press

$((-) 3 - 2nd \times^2 2 5 \rightarrow) \div (2 \times 2)$
ENTER

Answer

-2

Step 4 — Check both solutions

Value	Substitute into $2x^2 + 3x - 2$	Result
$x = 1/2$	$2(1/2)^2 + 3(1/2) - 2$	0
$x = -2$	$2(-2)^2 + 3(-2) - 2$	0

Meaning of the discriminant

If $b^2 - 4ac$ is positive, there are two real solutions. If it is 0, there is one repeated real solution. If it is negative, there are no real-number solutions.

Algebra & Polynomial Practice

Student calculator check before you begin:

☐ I know the difference between the (-) negative key and the subtraction key. ☐ I will use parentheses for negative substitutions. ☐ I will show algebra by hand before using the calculator to check.

Problems 1-16 — Show your work in the blocks below.

1. Evaluate $4x + 7$ when $x = 6$. 	2. Evaluate $3x^2 - 2x + 5$ when $x = -2$.
3. Evaluate $2a^3 - 5a$ when $a = 3$. 	4. Evaluate $(m + 4)^2 \div 3$ when $m = 5$.
5. For $f(x) = x^2 - 4x - 5$, find $f(-1)$, $f(0)$, $f(4)$, and $f(5)$. 	6. $(4x^2 + 3x - 8) + (2x^2 - 5x + 11)$
7. $(7x^2 - 4x + 9) - (3x^2 + 6x - 2)$ 	8. $3x(2x^2 - 5x + 4)$
9. $(x + 6)(x - 2)$ 	10. $(2x - 5)(x + 3)$
11. $(x - 4)^2$ 	12. Verify #10 by evaluating both forms at $x = 2$.
13. $4x + 9 = 37$ 	14. $3(x - 5) = 24$
15. $7x - 4 = 3x + 20$ 	16. $-5x + 2 \geq 17$

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Algebra & Polynomial Practice — Continued

Problems 17-20 — Show all algebra steps and calculator checks.

17. Factor $x^2 + 7x + 12$. Verify its zeros.

18. Factor $2x^2 + 7x + 3$. Check at $x = 2$.

19. Solve $x^2 - 9 = 0$. Check both solutions.

20. Use the quadratic formula to solve $3x^2 - 2x - 1 = 0$.

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Detailed Answer Key — Problems 1–8

#	Work	Answer / calculator check
1	$4(6)+7 = 24+7$	31. Press: $4 \times 6 + 7$ ENTER → 31.
2	$3(-2)^2-2(-2)+5 = 12+4+5$	21. Press: $3 \times ((-) 2) x^2 - 2 \times$ $((-) 2) + 5$ ENTER → 21.
3	$2(3^3)-5(3)=54-15$	39. Press: $2 \times 3 \wedge 3$  $- 5 \times$ 3 ENTER → 39.
4	$(5+4)^2 \div 3 = 81 \div 3$	27. Press: $(5 + 4) x^2 \div 3$ ENTER → 27.
5	$f(-1)=0; f(0)=-5; f(4)=-5;$ $f(5)=0$	0, -5, -5, 0. Direct checks: $((-) 1) x^2 - 4 \times ((-) 1) - 5$ ENTER → 0; repeat for 0, 4, 5. Or use TABLE.
6	$(4x^2+2x^2)+(3x-5x)+(-8+11)$	$6x^2 - 2x + 3$. Check $x=2$: original and simplified both give 23. Use parentheses around each polynomial when checking.
7	$7x^2-4x+9-3x^2-6x+2$	$4x^2 - 10x + 11$. Check $x=1$: both forms give 5.
8	$3x \cdot 2x^2 + 3x \cdot (-5x) + 3x \cdot 4$	$6x^3 - 15x^2 + 12x$. Check $x=2$: $3 \times 2 \times (2 \times 2 x^2 - 5 \times 2 + 4)$ ENTER → 12; expanded form also → 12.

Detailed Answer Key — Problems 9–16

#	Full algebra	Answer and check
9	$(x+6)(x-2) = x^2 - 2x + 6x - 12$	$x^2 + 4x - 12$. Check $x=2$: $(2+6) \times (2-2)$ ENTER $\rightarrow 0$; 2 $x^2 + 4 \times 2 - 12$ ENTER $\rightarrow 0$.
10	$(2x-5)(x+3) = 2x^2 + 6x - 5x - 15$	$2x^2 + x - 15$. Check $x=2$: $(2 \times 2 - 5) \times (2 + 3)$ ENTER $\rightarrow -5$; $2 \times 2 \times 2 + 2 - 15$ ENTER $\rightarrow -5$.
11	$(x-4)^2 = (x-4)(x-4)$	$x^2 - 8x + 16$. Check $x=5$: $(5-4) x^2$ ENTER $\rightarrow 1$; 5 $x^2 - 8 \times 5 + 16$ ENTER $\rightarrow 1$.
12	Original at $x=2$: $(4-5)$ $(2+3) = -1.5$	-5 . Press original at $x=2$: $(2 \times 2 - 5) \times (2 + 3)$ ENTER $\rightarrow -5$. Expanded: $2 \times 2 \times 2 + 2 - 15$ ENTER $\rightarrow -5$.
13	$4x+9=37 \rightarrow 4x=28 \rightarrow x=7$	$x=7$. Check: $4 \times 7 + 9$ ENTER $\rightarrow 37$.
14	$3(x-5)=24 \rightarrow x-5=8 \rightarrow x=13$	$x=13$. Check: $3 \times (13-5)$ ENTER $\rightarrow 24$.
15	$7x-4=3x+20 \rightarrow 4x=24 \rightarrow x=6$	$x=6$. Left: $7 \times 6 - 4$ ENTER $\rightarrow$ 38. Right: $3 \times 6 + 20$ ENTER $\rightarrow$ 38.
16	$-5x+2 \geq 17 \rightarrow -5x \geq 15 \rightarrow$ divide by -5 and reverse sign	$x \leq -3$. Boundary check: $(-) 5 \times ((-) 3) + 2$ ENTER $\rightarrow 17$. Test $x=0$ gives 2, so 0 is not a solution.

Problem 16 reminder

The inequality sign reverses because both sides were divided by a negative number.

Detailed Answer Key — Problems 17–20

17. Factor $x^2 + 7x + 12$

Find two numbers that multiply to 12 and add to 7: 3 and 4. Therefore, $x^2 + 7x + 12 = (x + 3)(x + 4)$.

Zeros: $x + 3 = 0$ gives $x = -3$; $x + 4 = 0$ gives $x = -4$. A table for $x^2 + 7x + 12$ shows output 0 at -4 and -3 . TABLE check: press TABLE; enter $x^2 + 7x + 12$; ENTER; set Start = (-4) , Step = 1, Auto; ENTER. The table shows $y=0$ at $x=-4$ and $x=-3$.

18. Factor $2x^2 + 7x + 3$

The factorization is $(2x + 1)(x + 3)$, because $2x^2 + 6x + x + 3 = 2x^2 + 7x + 3$.

Check at $x = 2$: original form = $2(2^2) + 7(2) + 3 = 8 + 14 + 3 = 25$. Factored form = $(2 \cdot 2 + 1)(2 + 3) = 5 \cdot 5 = 25$. Calculator: $2 \times 2 \times 2 + 7 \times 2 + 3$ ENTER $\rightarrow 25$; then $(2 \times 2 + 1) \times (2 + 3)$ ENTER $\rightarrow 25$.

19. Solve $x^2 - 9 = 0$

This is a difference of squares: $x^2 - 3^2 = (x - 3)(x + 3)$. Therefore, $x = 3$ or $x = -3$. Checks: $3^2 - 9 = 0$ and $(-3)^2 - 9 = 0$. Calculator checks: $3 \times 3 - 9$ ENTER $\rightarrow 0$; then $(-3) \times (-3) - 9$ ENTER $\rightarrow 0$.

20. Solve $3x^2 - 2x - 1 = 0$

$a = 3$, $b = -2$, $c = -1$. Discriminant: $b^2 - 4ac = (-2)^2 - 4(3)(-1) = 4 + 12 = 16$.

$x = \frac{-b \pm \sqrt{16}}{2a} = \frac{(2 \pm 4)}{6}$. Calculator: $(2 + 2\text{nd } x^2 16 \rightarrow)$ $\div 6$ ENTER $\rightarrow 1$; then $(2 - 2\text{nd } x^2 16 \rightarrow)$ $\div 6$ ENTER $\rightarrow -1/3$.

Sign	Calculation	Solution
+	$(2 + 4) \div 6 = 6/6$	$x = 1$
-	$(2 - 4) \div 6 = -2/6$	$x = -1/3$

Checks: $3(1)^2 - 2(1) - 1 = 0$. For $x = -1/3$, $3(1/9) + 2/3 - 1 = 1/3 + 2/3 - 1 = 0$.

Algebra & Polynomial Quick Reference

Task	What students do	How the calculator helps
Evaluate	Replace the variable with the given number.	Performs arithmetic and powers.
Negative substitution	Put the negative value in parentheses.	Correctly evaluates powers such as $(-3)^2$.
Combine like terms	Add/subtract coefficients of matching powers.	Checks both forms at a chosen x-value.
Multiply polynomials	Distribute every term and combine like terms.	Checks original and expanded forms.
Factor	Find factors on paper.	Checks factors by substitution or finds zeros in a table.
Solve linear equations	Use inverse operations on paper.	Checks the proposed solution.
Solve quadratics	Factor or use the quadratic formula.	Computes discriminant, roots, fractions, and decimals.
Graph-related work	Use a table of values.	Shows inputs and outputs, zeros, and patterns.

Remember

This calculator is an arithmetic and checking tool. It supports algebra, but it does not replace the reasoning steps that earn points on the GED or HiSET.

Best buttons for algebra

Button or feature	Use
()	Group substituted values, numerators, and denominators.
(-)	Enter a negative number.
x^2 and $^{\wedge}$	Evaluate squares and other powers.
2nd then x^2	Square root for formulas.
n/d and toggle	Keep exact fractions or switch to decimals.
sto → and variables	Reuse a stored value.
TABLE	Evaluate a rule for many x-values.

More Algebra & Polynomial Practice

Problems 21-25 — Workspace

21. Evaluate $5x^2 - 3x + 4$ when $x = -2$.

22. Evaluate $-2a^3 + 7a - 1$ when $a = 3$.

23. Evaluate $(m - 5)^2 + 2m$ when $m = -1$.

24. For $f(x)=2x^3-x^2+4$, find $f(-2)$, $f(0)$, $f(3)$.

25. For $g(x)=x^2+2x-8$, find $g(-4)$, $g(-2)$, $g(0)$, $g(2)$, $g(4)$; identify zeros.

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More Algebra & Polynomial Practice — Continued

Problems 26-35 — Workspace

26. Simplify: $(6x^2 - 4x + 9) + (3x^2 + 7x - 5)$.	27. Simplify: $(8y^3 - 2y^2 + 5y - 1) - (3y^3 + 4y^2 - y + 6)$.
28. Simplify: $4a^2 + 3a - 7 + 2a^2 - 8a + 9 - a^2 + 5a - 2$.	29. Simplify: $(7x^3 - 5x^2 + 2x) - (2x^3 - x^2 + 6x - 4)$.
30. Simplify: $(3p^2 - 2p + 1) + (-5p^2 + 6p - 9)$.	31. Multiply: $4x(3x^2 - 2x + 5)$.
32. Multiply: $(x + 7)(x - 5)$.	33. Multiply: $(2x - 3)(x + 4)$.
34. Multiply: $(3x + 2)(2x - 5)$.	35. Expand: $(x - 6)^2$.

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More Algebra & Polynomial Practice — Continued

Problems 36-45 — Workspace

36. Solve and check: $5x - 7 = 28$.	37. Solve and check: $4(x + 3) = 2x + 18$.
38. Solve and check: $3x + 11 = 5x - 9$.	39. Solve and graph: $-4x + 6 < 22$.
40. Solve and graph: $7 - 3x \geq 19$.	41. Factor $x^2 + 9x + 20$. Find zeros.
42. Factor $x^2 - 11x + 24$. Find zeros.	43. Factor $2x^2 + 9x + 4$. Find zeros.
44. Factor $3x^2 - 12x$ completely. Find zeros.	45. Factor $x^2 - 49$. Find zeros.

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More Algebra & Polynomial Practice — Challenge Set

Problems 46-50 — Workspace

46. Use the quadratic formula to solve $x^2 - 6x + 5 = 0$.

47. Use the quadratic formula to solve $2x^2 + x - 6 = 0$.

48. Use the quadratic formula to solve $4x^2 - 4x - 3 = 0$.

49. Rectangle: width x , length $x+5$, area 24. Write and solve the equation.

50. Prove equivalence by expansion; check both forms at $x=-3$; find zeros.

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Detailed Answer Key — Problems 21–25

21. Evaluate $5x^2 - 3x + 4$ when $x = -2$.

Substitute: $5(-2)^2 - 3(-2) + 4$.

Exponent first: $(-2)^2 = 4$, so $5(4) + 6 + 4$.

Simplify: $20 + 6 + 4 = 30$.

Answer: 30.

Calculator check: Press: $5 \times ((-) 2) x^2 - 3 \times ((-) 2) + 4$ enter $\rightarrow 30$.

22. Evaluate $-2a^3 + 7a - 1$ when $a = 3$.

Substitute: $-2(3^3) + 7(3) - 1$.

Exponent first: $3^3 = 27$.

Multiply: $-2(27) = -54$ and $7(3) = 21$.

Simplify: $-54 + 21 - 1 = -34$.

Answer: -34.

Calculator check: Press: $(-) 2 \times 3 \wedge 3 + 7 \times 3 - 1$ ENTER $\rightarrow -34$.

23. Evaluate $(m - 5)^2 + 2m$ when $m = -1$.

Substitute: $(-1 - 5)^2 + 2(-1)$.

Inside parentheses: $-1 - 5 = -6$.

Square: $(-6)^2 = 36$.

Finish: $36 - 2 = 34$.

Answer: 34.

Calculator check: Press: $((-) 1 - 5) x^2 + 2 \times ((-) 1)$ enter $\rightarrow 34$.

24. For $f(x) = 2x^3 - x^2 + 4$, find $f(-2)$, $f(0)$, and $f(3)$.

For $x = -2$: $2(-2)^3 - (-2)^2 + 4 = 2(-8) - 4 + 4 = -16$.

For $x = 0$: $2(0)^3 - 0^2 + 4 = 4$.

For $x = 3$: $2(3^3) - 3^2 + 4 = 54 - 9 + 4 = 49$.

Answer: $f(-2)=-16$, $f(0)=4$, $f(3)=49$.

Calculator check: Enter each value separately, or use the table feature with $f(x)=2x^3-x^2+4$.

25. For $g(x) = x^2 + 2x - 8$, find $g(-4)$, $g(-2)$, $g(0)$, $g(2)$, and $g(4)$. Then identify any zeros shown by these values.

$x = -4$: $16 - 8 - 8 = 0$.

$x = -2$: $4 - 4 - 8 = -8$.

$x = 0$: $0 + 0 - 8 = -8$.

$x = 2$: $4 + 4 - 8 = 0$.

$x = 4$: $16 + 8 - 8 = 16$.

Zeros: The output equals 0 at $x = -4$ and $x = 2$.

Calculator check: Use the table feature for $g(x)=x^2+2x-8$ with start -4 and step 2.

Detailed Answer Key — Problems 26–30

26. Simplify: $(6x^2 - 4x + 9) + (3x^2 + 7x - 5)$.

Group like terms: $(6x^2 + 3x^2) + (-4x + 7x) + (9 - 5)$.

Combine: $9x^2 + 3x + 4$.

Answer: $9x^2 + 3x + 4$.

Calculator check: Check at $x=2$: original = 46; simplified = 46.

27. Simplify: $(8y^3 - 2y^2 + 5y - 1) - (3y^3 + 4y^2 - y + 6)$.

Distribute the subtraction: $8y^3 - 2y^2 + 5y - 1 - 3y^3 - 4y^2 + y - 6$.

Group like terms: $(8-3)y^3 + (-2-4)y^2 + (5+1)y + (-1-6)$.

Answer: $5y^3 - 6y^2 + 6y - 7$.

Calculator check: Check at $y=1$: original = -2; simplified = -2.

28. Simplify: $4a^2 + 3a - 7 + 2a^2 - 8a + 9 - a^2 + 5a - 2$.

Group x^2 terms: $4a^2 + 2a^2 - a^2 = 5a^2$.

Group a terms: $3a - 8a + 5a = 0a$.

Constants: $-7 + 9 - 2 = 0$.

Answer: $5a^2$.

Calculator check: Check at $a=2$: original = 20; $5a^2 = 20$.

29. Simplify: $(7x^3 - 5x^2 + 2x) - (2x^3 - x^2 + 6x - 4)$.

Distribute the minus sign: $7x^3 - 5x^2 + 2x - 2x^3 + x^2 - 6x + 4$.

Combine like terms: $5x^3 - 4x^2 - 4x + 4$.

Answer: $5x^3 - 4x^2 - 4x + 4$.

Calculator check: Check at $x=1$: both forms equal 1.

30. Simplify: $(3p^2 - 2p + 1) + (-5p^2 + 6p - 9)$.

Combine p^2 terms: $3p^2 - 5p^2 = -2p^2$.

Combine p terms: $-2p + 6p = 4p$.

Constants: $1 - 9 = -8$.

Answer: $-2p^2 + 4p - 8$.

Calculator check: Check at $p=2$: original = -8; simplified = -8.

Detailed Answer Key — Problems 31–35

31. Multiply: $4x(3x^2 - 2x + 5)$.

Distribute $4x$ to each term: $4x \cdot 3x^2 = 12x^3$; $4x \cdot (-2x) = -8x^2$; $4x \cdot 5 = 20x$.

Answer: $12x^3 - 8x^2 + 20x$.

Calculator check: Check at $x=2$: $4(2)(12-4+5)=104$; expanded form also gives 104.

32. Multiply: $(x + 7)(x - 5)$.

Multiply: $x \cdot x = x^2$, $x \cdot (-5) = -5x$, $7 \cdot x = 7x$, $7 \cdot (-5) = -35$.

Combine middle terms: $-5x + 7x = 2x$.

Answer: $x^2 + 2x - 35$.

Calculator check: Check at $x=3$: $(10)(-2)=-20$; $9+6-35=-20$.

33. Multiply: $(2x - 3)(x + 4)$.

Multiply: $2x \cdot x = 2x^2$; $2x \cdot 4 = 8x$; $-3 \cdot x = -3x$; $-3 \cdot 4 = -12$.

Combine: $8x - 3x = 5x$.

Answer: $2x^2 + 5x - 12$.

Calculator check: Check at $x=2$: $(1)(6)=6$; $8+10-12=6$.

34. Multiply: $(3x + 2)(2x - 5)$.

Multiply: $3x \cdot 2x = 6x^2$; $3x \cdot (-5) = -15x$; $2 \cdot 2x = 4x$; $2 \cdot (-5) = -10$.

Combine: $-15x + 4x = -11x$.

Answer: $6x^2 - 11x - 10$.

Calculator check: Check at $x=1$: $(5)(-3)=-15$; $6-11-10=-15$.

35. Expand: $(x - 6)^2$.

Write as a product: $(x-6)(x-6)$.

Multiply: $x^2 - 6x - 6x + 36$.

Combine: $x^2 - 12x + 36$.

Answer: $x^2 - 12x + 36$.

Calculator check: Check at $x=8$: $(8-6)^2=4$; $64-96+36=4$.

Detailed Answer Key — Problems 36–40

36. Solve and check: $5x - 7 = 28$.

Start: $5x - 7 = 28$.

Add 7 to both sides: $5x = 35$.

Divide by 5: $x = 7$.

Answer: $x = 7$.

Calculator check: Check: $5 \times 7 - 7$ enter $\rightarrow 28$.

37. Solve and check: $4(x + 3) = 2x + 18$.

Distribute: $4x + 12 = 2x + 18$.

Subtract $2x$: $2x + 12 = 18$.

Subtract 12: $2x = 6$.

Divide by 2: $x = 3$.

Answer: $x = 3$.

Calculator check: Check: $4 \times (3+3) = 24$ and $2 \times 3 + 18 = 24$.

38. Solve and check: $3x + 11 = 5x - 9$.

Start: $3x + 11 = 5x - 9$.

Subtract $3x$: $11 = 2x - 9$.

Add 9: $20 = 2x$.

Divide by 2: $x = 10$.

Answer: $x = 10$.

Calculator check: Check: $3 \times 10 + 11 = 41$ and $5 \times 10 - 9 = 41$.

39. Solve and graph on a number line: $-4x + 6 < 22$.

Start: $-4x + 6 < 22$.

Subtract 6: $-4x < 16$.

Divide by -4 : $x > -4$. The sign reverses because we divided by a negative number.

Graph: Open circle at -4 ; shade to the right.

Answer: $x > -4$.

Calculator check: Test $x=0$: $-4(0)+6=6$, and $6 < 22$ is true.

40. Solve and graph on a number line: $7 - 3x \geq 19$.

Start: $7 - 3x \geq 19$.

Subtract 7: $-3x \geq 12$.

Divide by -3 : $x \leq -4$. Reverse $\geq$ to $\leq$.

Graph: Closed circle at -4 ; shade to the left.

Answer: $x \leq -4$.

Calculator check: Test $x=-5$: $7-3(-5)=22$, and $22 \geq 19$ is true.

Detailed Answer Key — Problems 41–45

41. Factor $x^2 + 9x + 20$. Then find its zeros.

Find two numbers: They must multiply to 20 and add to 9: 4 and 5.

Factor: $x^2+9x+20=(x+4)(x+5)$.

Set each factor to 0: $x+4=0$ gives $x=-4$; $x+5=0$ gives $x=-5$.

Answer: $(x+4)(x+5)$; zeros -4 and -5 .

Calculator check: Table check: $x^2+9x+20$ gives 0 at $x=-5$ and $x=-4$.

42. Factor $x^2 - 11x + 24$. Then find its zeros.

Find two numbers: They must multiply to 24 and add to -11 : -3 and -8 .

Factor: $x^2-11x+24=(x-3)(x-8)$.

Zeros: $x=3$ and $x=8$.

Answer: $(x-3)(x-8)$; zeros 3 and 8.

Calculator check: Table check: outputs are 0 at $x=3$ and $x=8$.

43. Factor $2x^2 + 9x + 4$. Then find its zeros.

Multiply a·c: $2 \cdot 4 = 8$. We need two numbers that multiply to 8 and add to 9: 8 and 1.

Split the middle term: $2x^2+8x+x+4$.

Factor by grouping: $2x(x+4)+1(x+4)=(2x+1)(x+4)$.

Zeros: $2x+1=0 \rightarrow x=-1/2$; $x+4=0 \rightarrow x=-4$.

Answer: $(2x+1)(x+4)$; zeros $-1/2$ and -4 .

Calculator check: Check at $x=2$: original 30; factored $(5)(6)=30$.

44. Factor $3x^2 - 12x$ completely. Then find its zeros.

Greatest common factor: Both terms contain $3x$.

Factor: $3x^2-12x=3x(x-4)$.

Zeros: $3x=0$ gives $x=0$; $x-4=0$ gives $x=4$.

Answer: $3x(x-4)$; zeros 0 and 4.

Calculator check: Table check: $3x^2-12x$ is 0 at $x=0$ and $x=4$.

45. Factor $x^2 - 49$. Then find its zeros.

Recognize a difference of squares: $x^2-49=x^2-7^2$.

Factor: $(x-7)(x+7)$.

Zeros: $x=7$ and $x=-7$.

Answer: $(x-7)(x+7)$; zeros ± 7 .

Calculator check: Check: at $x=8$, original $64-49=15$; factored $(1)(15)=15$.

Detailed Answer Key — Problems 46–50

46. Use the quadratic formula to solve $x^2 - 6x + 5 = 0$.

Identify coefficients: $a=1$, $b=-6$, $c=5$.

Discriminant: $b^2-4ac=(-6)^2-4(1)(5)=36-20=16$.

Square root: $\sqrt{16}=4$.

Formula: $x=(6\pm4)/2$.

Two solutions: $x=(6+4)/2=5$; $x=(6-4)/2=1$.

Answer: $x=1$ or $x=5$.

Calculator check: PLUS root: (6 + 2nd x^2 1 6 ) $\div$ 2 ENTER $\rightarrow$ 5. MINUS root: (6 - 2nd x^2 1 6 ) $\div$ 2 ENTER $\rightarrow$ 1.

47. Use the quadratic formula to solve $2x^2 + x - 6 = 0$.

Identify coefficients: $a=2$, $b=1$, $c=-6$.

Discriminant: $1^2-4(2)(-6)=1+48=49$.

Square root: $\sqrt{49}=7$.

Formula: $x=(-1\pm7)/4$.

Solutions: $x=(-1+7)/4=6/4=3/2$; $x=(-1-7)/4=-8/4=-2$.

Answer: $x=3/2$ or $x=-2$.

Calculator check: Calculator: ((-)1 + 2nd x^2 49 ) $\div$ 4 $\rightarrow$ 1.5; ((-)1 - 2nd x^2 49 ) $\div$ 4 $\rightarrow$ -2.

48. Use the quadratic formula to solve $4x^2 - 4x - 3 = 0$.

Identify coefficients: $a=4$, $b=-4$, $c=-3$.

Discriminant: $(-4)^2-4(4)(-3)=16+48=64$.

Square root: $\sqrt{64}=8$.

Formula: $x=(4\pm8)/8$.

Solutions: $x=12/8=3/2$; $x=-4/8=-1/2$.

Answer: $x=3/2$ or $x=-1/2$.

Calculator check: Calculator: (4+8) $\div$ 8 $\rightarrow$ 1.5; (4-8) $\div$ 8 $\rightarrow$ -0.5.

49. A rectangle has width x feet and length $x + 5$ feet. Its area is 24 square feet. Write and solve the quadratic equation. Use the positive solution for the width.

Area equation: width $\times$ length = 24, so $x(x+5)=24$.

Write in standard form: $x^2+5x-24=0$.

Factor: $(x+8)(x-3)=0$.

Solutions: $x=-8$ or $x=3$.

Use the physical meaning: A width cannot be negative, so $x=3$ feet.

Length: $x+5=8$ feet.

Answer: Width 3 ft; length 8 ft.

Calculator check: Check: 3×8 enter $\rightarrow$ 24 square feet.

50. Verify algebraically that $(2x - 1)(x + 5)$ and $2x^2 + 9x - 5$ are equivalent. Then check both forms at $x = -3$ and find the zeros of the factored form.

Expand first: $(2x-1)(x+5)=2x^2+10x-x-5=2x^2+9x-5$, so the expressions are algebraically equivalent. Now check $x=-3$: $(2(-3)-1)(-3+5)=(-7)(2)=-14$.

Check expanded form: $2(-3)^2+9(-3)-5=18-27-5=-14$.

Conclusion: The expansion proves the expressions are equivalent, and the $x=-3$ numerical check confirms both forms give -14 .

Find zeros from factors: $2x-1=0 \rightarrow x=1/2$; $x+5=0 \rightarrow x=-5$.

Answer: Check value -14 ; zeros $1/2$ and -5 .

Calculator check: Calculator: evaluate each form with $x=-3$; both should display -14 .

Calculator-Button Verification Note

All calculator paths in this edition were checked against the Texas Instruments TI-30XS MultiView guidebook and teacher guide. Key points: π is a direct key; STO $\rightarrow$ stores values; 2nd + STO $\rightarrow$ opens Recall Var; TABLE opens the function table; 2nd + n/d enters a mixed-number template after the whole-number part; 2nd + $\times 10^n$ converts $n/d \leftrightarrow Un/d$; the $(-)$ key is different from subtraction; and MathPrint templates require arrow-key navigation before continuing an expression.

For algebra, the TI-30XS MultiView evaluates and checks numerical substitutions and builds tables, but it does not symbolically combine like terms, factor polynomials, or automatically solve equations for x . Those algebra steps must still be shown on paper.

COPY-READY STUDENT WORKSHEETS

Copy-ready student pages. Permission granted to copy these pages for classroom/student use.

Worksheet 1 - Calculator Basics & Order of Operations	Worksheet 2 - Fractions, Powers, Roots & Percents
Name: _____ Date: _____	Name: _____ Date: _____
1. $58 + 76$ Show your work:	1. $\frac{1}{3} + \frac{1}{6}$ Show your work:
2. $324 \div 9$ Show your work:	2. $\frac{5}{8} - \frac{1}{4}$ Show your work:
3. $(8 + 4) \times 7$ Show your work:	3. $\frac{3}{5} \times \frac{10}{9}$ Show your work:
4. $-18 + 11$ Show your work:	4. Write $\frac{7}{8}$ as a decimal. Show your work:
5. -7×-8 Show your work:	5. 13^2 Show your work:
6. $25 - 43$ Show your work:	6. 4^3 Show your work:
7. $6 + 4 \times (15 - 9)$ Show your work:	7. $\sqrt{196}$ Show your work:
8. $(24 - 6) \div 3 + 5$ Show your work:	8. Find 18% of 250. Show your work:
	9. \$72 item is 25% off. Sale price? Show your work:
	10. Add 15% tip to \$48. Total? Show your work:
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Worksheet 3 - Evaluating Algebraic Expressions Name: _____ Date: _____	Worksheet 4 - Polynomial Operations Name: _____ Date: _____
1. $3x + 7$ when $x=5$ Show your work:	1. $(3x^2+5x-2)+(2x^2-x+7)$ Show your work:
2. $4x - 9$ when $x=-3$ Show your work:	2. $(6x^2+3x-4)-(2x^2-5x+1)$ Show your work:
3. $x^2 + 2x - 8$ when $x=4$ Show your work:	3. $(x+4)(x+3)$ Show your work:
4. $2x^2 - 5x + 1$ when $x=-2$ Show your work:	4. $(2x-5)(x+6)$ Show your work:
5. $3a + 2b$, $a=4$, $b=7$ Show your work:	5. $x(x^2-4x+7)$ Show your work:
6. $2m^2 - 3n$, $m=5$, $n=6$ Show your work:	6. $4x^2+3x-8+2x^2-7x+5$ Show your work:
7. $(x+3)(x-2)$, $x=6$ Show your work:	Permission granted to copy this page for classroom/student use.
8. $5 - 2x^3$, $x=-2$ Show your work:	
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Worksheet 5 - Equations & Inequalities Name: _____ Date: _____	Worksheet 6 - Factoring, Zeros & Quadratics Name: _____ Date: _____
1. $3x + 8 = 29$ Show your work:	1. Factor $x^2+7x+12$ Show your work:
2. $5x - 12 = 23$ Show your work:	2. Factor x^2-9 Show your work:
3. $4(x + 2) = 36$ Show your work:	3. Factor x^2-5x+6 Show your work:
4. $7 - 2x = 19$ Show your work:	4. Zeros of $(x-4)(x+2)=0$ Show your work:
5. $3x + 5 < 20$ Show your work:	5. Solve $x^2-16=0$ Show your work:
6. $-2x + 6 \geq 14$ Show your work:	6. $x^2+5x+6=0$ Show your work:
7. Check $x=7$ in $4x-3=25$ Show your work:	7. $2x^2+x-6=0$ Show your work:
8. Check $x=-4$ in $2x+11=3$ Show your work:	8. Factor area $x^2+7x+12$ Show your work:
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WORKSHEET 1 - CALCULATOR BASICS & ORDER OF OPERATIONS

TEACHER ANSWER KEY — SHOW BY HAND AND CHECK WITH THE TI-30XS MULTIVIEW

#	PROBLEM	BY HAND	TI-30XS BUTTONS / CHECK	FINAL ANSWER
1	$58 + 76$	$58 + 76 = 134$	5 8 + 7 6 ENTER -> 134	134
2	$324 \div 9$	$324 \div 9 = 36$	3 2 4 $\div$ 9 ENTER -> 36	36
3	$(8 + 4) \times 7$	$8 + 4 = 12$; $12 \times 7 = 84$	(8 + 4) $\times$ 7 ENTER -> 84	84
4	$-18 + 11$	$18 - 11 = 7$, keep the sign of -18 -> -7	(-) 1 8 + 1 1 ENTER -> -7	-7
5	-7×-8	negative $\times$ negative = positive; $7 \times 8 = 56$	(-) 7 $\times$ (-) 8 ENTER -> 56	56
6	$25 - 43$	$43 - 25 = 18$; 25 is smaller -> -18	2 5 - 4 3 ENTER -> -18	-18
7	$6 + 4 \times (15 - 9)$	$15 - 9 = 6$; $4 \times 6 = 24$; $6 + 24 = 30$	6 + 4 $\times$ (1 5 - 9) ENTER -> 30	30
8	$(24 - 6) \div 3 + 5$	$24 - 6 = 18$; $18 \div 3 = 6$; $6 + 5 = 11$	(2 4 - 6) $\div$ 3 + 5 ENTER -> 11	11

WORKSHEET 2 - FRACTIONS, POWERS, ROOTS & PERCENTS

TEACHER ANSWER KEY — SHOW BY HAND AND CHECK WITH THE TI-30XS MULTIVIEW

#	PROBLEM	BY HAND	TI-30XS BUTTONS / CHECK	FINAL ANSWER
1	$1/3 + 1/6$	$1/3 = 2/6$; $2/6 + 1/6 = 3/6 = 1/2$	n/d 1 ▼ 3  + n/d 1 ▼ 6 ENTER	1/2
2	$5/8 - 1/4$	$1/4 = 2/8$; $5/8 - 2/8 = 3/8$	n/d 5 ▼ 8  - n/d 1 ▼ 4 ENTER	3/8
3	$3/5 \times 10/9$	$30/45$; divide top and bottom by 15 -> $2/3$	n/d 3 ▼ 5  $\times$ n/d 10 ▼ 9 ENTER	2/3
4	Write $7/8$ as a decimal	$7 \div 8 = 0.875$	$7 \div 8$ ENTER	0.875
5	13^2	$13 \times 13 = 169$	1 3 $\times^2$ ENTER	169
6	4^3	$4 \times 4 \times 4 = 64$	4 $\wedge$ 3 ENTER	64
7	$\sqrt{196}$	$14 \times 14 = 196$, so $\sqrt{196} = 14$	2nd $\times^2$ 1 9 6 ENTER	14
8	18% of 250	$18\% = 0.18$; $0.18 \times 250 = 45$	0 . 1 8 $\times$ 2 5 0 ENTER	45
9	\$72 item is 25% off	$0.25 \times 72 = 18$ discount; $72 - 18 = 54$	7 2 - 0 . 2 5 $\times$ 7 2 ENTER	\$54.00
10	Add 15% tip to \$48	$0.15 \times 48 = 7.20$; $48 + 7.20 = 55.20$	4 8 + 0 . 1 5 $\times$ 4 8 ENTER	\$55.20

WORKSHEET 3 - EVALUATING ALGEBRAIC EXPRESSIONS

TEACHER ANSWER KEY — SHOW BY HAND AND CHECK WITH THE TI-30XS MULTIVIEW

#	PROBLEM	BY HAND	TI-30XS BUTTONS / CHECK	FINAL ANSWER
1	$3x + 7, x = 5$	$3(5) + 7 = 15 + 7 = 22$	$3 \times 5 + 7$ ENTER	22
2	$4x - 9, x = -3$	$4(-3) - 9 = -12 - 9 = -21$	$4 \times (-) 3 - 9$ ENTER	-21
3	$x^2 + 2x - 8, x = 4$	$4^2 + 2(4) - 8 = 16 + 8 - 8 = 16$	$4 x^2 + 2 \times 4 - 8$ ENTER	16
4	$2x^2 - 5x + 1, x = -2$	$2(4) - 5(-2) + 1 = 8 + 10 + 1 = 19$	$2 \times ((-)2) x^2 - 5 \times ((-)2) + 1$ ENTER	19
5	$3a + 2b, a=4, b=7$	$3(4) + 2(7) = 12 + 14 = 26$	$3 \times 4 + 2 \times 7$ ENTER	26
6	$2m^2 - 3n, m=5, n=6$	$2(25) - 18 = 50 - 18 = 32$	$2 \times 5 x^2 - 3 \times 6$ ENTER	32
7	$(x + 3)(x - 2), x=6$	$(6+3)(6-2) = 9 \times 4 = 36$	$(6 + 3) \times (6 - 2)$ ENTER	36
8	$5 - 2x^3, x=-2$	$(-2)^3=-8; 2(-8)=-16; 5-(-16)=21$	$5 - 2 \times ((-)2) ^ 3$ ENTER	21

WORKSHEET 4 - POLYNOMIAL OPERATIONS

TEACHER ANSWER KEY — SHOW BY HAND AND CHECK WITH THE TI-30XS MULTIVIEW

#	PROBLEM	BY HAND	TI-30XS BUTTONS / CHECK	FINAL ANSWER
1	$(3x^2+5x-2)+(2x^2-x+7)$	$(3+2)x^2 + (5-1)x + (-2+7) = 5x^2+4x+5$	Check x=2: original ENTER = 33; $5 \times 2^2 + 4 \times 2 + 5$ ENTER = 33	$5x^2 + 4x + 5$
2	$(6x^2+3x-4)-(2x^2-5x+1)$	$6x^2+3x-4-2x^2+5x-1 = 4x^2+8x-5$	Check x=2: original ENTER = 27; $4 \times 2^2 + 8 \times 2 - 5$ ENTER = 27	$4x^2 + 8x - 5$
3	$(x+4)(x+3)$	$x^2+3x+4x+12 = x^2+7x+12$	Check x=2: $(2+4)(2+3)$ ENTER = 30; $2^2+7(2)+12$ ENTER = 30	$x^2 + 7x + 12$
4	$(2x-5)(x+6)$	$2x^2+12x-5x-30 = 2x^2+7x-30$	Check x=2: $(4-5)(8)=-8$; $2(4)+14-30=-8$	$2x^2 + 7x - 30$
5	$x(x^2-4x+7)$	$x^3 - 4x^2 + 7x$	Check x=2: $2(4-8+7)$ ENTER = 6; $2^3-4(2^2)+7(2)$ ENTER = 6	$x^3 - 4x^2 + 7x$
6	$4x^2+3x-8+2x^2-7x+5$	$(4+2)x^2 + (3-7)x + (-8+5) = 6x^2-4x-3$	Check x=2: original ENTER = 13; $6 \times 2^2 - 4 \times 2 - 3$ ENTER = 13	$6x^2 - 4x - 3$

WORKSHEET 5 - EQUATIONS & INEQUALITIES

TEACHER ANSWER KEY — SHOW BY HAND AND CHECK WITH THE TI-30XS MULTIVIEW

#	PROBLEM	BY HAND	TI-30XS BUTTONS / CHECK	FINAL ANSWER
1	$3x + 8 = 29$	$3x=21; x=7$	Check: $3 \times 7 + 8$ ENTER -> 29	$x = 7$
2	$5x - 12 = 23$	$5x=35; x=7$	Check: $5 \times 7 - 12$ ENTER -> 23	$x = 7$
3	$4(x + 2) = 36$	$x+2=9; x=7$	Check: $4 \times (7+2)$ ENTER -> 36	$x = 7$
4	$7 - 2x = 19$	$-2x=12; x=-6$	Check: $7 - 2 \times ((-6))$ ENTER -> 19	$x = -6$
5	$3x + 5 < 20$	$3x<15; x<5$	Boundary: $3 \times 5 + 5$ ENTER -> 20; 5 is not included	$x < 5$
6	$-2x + 6 \geq 14$	$-2x \geq 8$; divide by -2 and reverse sign -> $x \leq -4$	Boundary: $(-2) \times ((-4)) + 6$ ENTER -> 14	$x \leq -4$
7	Check $x=7$ in $4x-3=25$	$4(7)-3 = 28-3 = 25$	$4 \times 7 - 3$ ENTER -> 25	True
8	Check $x=-4$ in $2x+11=3$	$2(-4)+11 = -8+11 = 3$	$2 \times ((-4)) + 11$ ENTER -> 3	True

WORKSHEET 6 - FACTORING, ZEROS & QUADRATIC EQUATIONS

TEACHER ANSWER KEY — SHOW BY HAND AND CHECK WITH THE TI-30XS MULTIVIEW

#	PROBLEM	BY HAND	TI-30XS BUTTONS / CHECK	FINAL ANSWER
1	Factor $x^2 + 7x + 12$	Numbers that multiply to 12 and add to 7: 3,4 → $(x+3)(x+4)$	Check $x=2$: $2^2+7(2)+12=30$; $(2+3)(2+4)=30$	$(x+3)(x+4)$
2	Factor $x^2 - 9$	Difference of squares: $x^2-3^2 = (x-3)(x+3)$	Check $x=5$: $25-9=16$; $(5-3)(5+3)=16$	$(x-3)(x+3)$
3	Factor $x^2 - 5x + 6$	Numbers multiply to 6, add to -5: -2,-3 → $(x-2)(x-3)$	Check $x=4$: $16-20+6=2$; $(2)(1)=2$	$(x-2)(x-3)$
4	Zeros of $(x-4)(x+2)=0$	$x-4=0 \rightarrow x=4$; $x+2=0 \rightarrow x=-2$	Check $x=4$ and $x=-2$ in $(x-4)(x+2)$; both give 0	$x=4, -2$
5	Solve $x^2 - 16 = 0$	$(x-4)(x+4)=0 \rightarrow x=4$ or -4	$4 x^2 - 16$ ENTER → 0; $((-4) x^2 - 16$ ENTER → 0	$x=4, -4$
6	$x^2 + 5x + 6 = 0$	$a=1, b=5, c=6$; $D=25-24=1$; $x=(-5 \pm 1)/2 \rightarrow -2, -3$	PLUS: $((-) 5 + 2nd x^2 1 \rightarrow) \div 2$ ENTER → -2; MINUS: $((-) 5 - 2nd x^2 1 \rightarrow) \div 2$ ENTER → -3	$x=-2, -3$
7	$2x^2 + x - 6 = 0$	$a=2, b=1, c=-6$; $D=1+48=49$; $x=(-1 \pm 7)/4 \rightarrow 3/2, -2$	PLUS: $((-) 1 + 2nd x^2 4 9 \rightarrow) \div 4$ ENTER → 3/2; MINUS: $((-) 1 - 2nd x^2 4 9 \rightarrow) \div 4$ ENTER → -2	$x=3/2, -2$
8	Factor area $x^2 + 7x + 12$	Same trinomial: $(x+3)(x+4)$	Check $x=2$: both forms ENTER → 30	$(x+3)(x+4)$

TI-30XS MULTIVIEW BUTTON LEGEND

Use this chart with the teacher answer-key pages.

BUTTON	WHAT IT DOES
ON	Turns the calculator on.
2nd	Accesses the second function printed above a key.
OFF	2nd + ON turns the calculator off.
CLEAR	Clears the current entry line.
ENTER	Calculates / equals.
DEL	Deletes one character.
()	Groups quantities and controls order of operations.
n/d	Opens the fraction template.
▼	Moves from numerator to denominator in a fraction.
	Moves out of a fraction template so you can continue.
+	Add.
-	Subtract. Do not use this key to type a negative number.
×	Multiply.
÷	Divide.
(-)	Negative-number / change-sign key.
x^2	Squares the preceding value.
^	Raises a value to another power.
2nd + x^2	Square root.
π	Enters pi.
.	Decimal point.
fraction/decimal toggle	Switches an exact fraction answer and decimal form when available.
STO →	Stores a value in a variable.
2nd + STO → (Recall Var)	Opens the Recall Var menu so you can insert a stored variable value.
TABLE	Evaluates a function for selected x-values.
2nd + $x10^n$ (n/d ↔ Un/d)	Converts a simple/improper fraction to mixed-number form, or a mixed number back to a simple fraction.
2nd + n/d (Un/d)	After entering the whole-number part, opens the mixed-number template.
2nd +) (%)	Appends a percent sign after the percentage value.

IMPORTANT: Use (-) for negative numbers and the subtraction key only for subtraction. Use parentheses whenever a negative value is substituted into an expression.

Quick reminders: Students should show the algebra by hand first, then use the TI-30XS MultiView to calculate or verify. The calculator does not symbolically factor polynomials or solve equations for x ; the answer-key pages show how to check those results by substitution.

This image shows a single sheet of white paper with horizontal blue ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.