

A UNITS OF TIME

A.1 CHOOSING THE RIGHT UNITS OF TIME

MCQ 1: Which unit would you use to measure the time it takes to run 100 meters?

Check one answer:

- ☒ Seconds
- ☐ Minutes
- ☐ Hours
- ☐ Days
- ☐ Weeks
- ☐ Months
- ☐ Years

Answer:

- Running 100 meters is a very quick event.
- We need a small unit of time to measure it.
- The best unit is **seconds**. Yay!
- Answer: **seconds**.

MCQ 2: Which unit would you use to measure the time it takes to clean up your bedroom?

Check one answer:

- ☐ Seconds
- ☒ Minutes
- ☐ Hours
- ☐ Days
- ☐ Weeks
- ☐ Months
- ☐ Years

Answer:

- Cleaning up a bedroom takes a short time, like 10 to 30 minutes.
- We need a unit that's not too small or too big to measure it.
- The best unit is **minutes**. Yay!
- Answer: **minutes**.

MCQ 3: Which unit would you use to measure your age?

Check one answer:

- ☐ Seconds
- ☐ Minutes

- ☐ Hours
- ☐ Days
- ☐ Weeks
- ☐ Months
- ☒ Years

Answer:

- Your age is how many years you've lived, like 8 or 9 years.
- We need a unit that measures a long time for people.
- The best unit is **years**. Yay!
- Answer: **years**.

MCQ 4: Which unit would you use to measure the time it takes to watch a movie?

Check one answer:

- ☐ Seconds
- ☐ Minutes
- ☒ Hours
- ☐ Days

Answer:

- Watching a movie takes a medium amount of time, like 1 to 2 hours.
- We need a unit that's not too small or too big to measure it.
- The best unit is **hours**. Yay!
- Answer: **hours**.

MCQ 5: Which unit would you use to measure the time it takes to go on a family camping trip?

Check one answer:

- ☐ Seconds
- ☐ Minutes
- ☐ Hours
- ☒ Days

Answer:

- A family camping trip usually takes a few days, like 3 to 5 days.
- We need a unit that measures a few days, not too short or too long.
- The best unit is **days**. Yay!
- Answer: **days**.

B CONVERTING UNITS OF TIME

B.1 CONVERTING UNITS OF TIME FROM BIGGER TO SMALLER

Ex 6:  Convert 2 hours to minutes:

$$2 \text{ h} = \boxed{120} \text{ min}$$

Answer:

$$\begin{aligned} 2 \text{ h} &= 2 \times 60 \text{ min} \\ &= 120 \text{ min} \end{aligned}$$

Ex 7:  Convert 3 days to hours:

$$3 \text{ d} = \boxed{72} \text{ h}$$

Answer:

$$\begin{aligned} 3 \text{ d} &= 3 \times 24 \text{ h} \\ &= 72 \text{ h} \end{aligned}$$

Ex 8:  Convert 5 minutes to seconds:

$$5 \text{ min} = \boxed{300} \text{ s}$$

Answer:

$$\begin{aligned} 5 \text{ min} &= 5 \times 60 \text{ s} \\ &= 300 \text{ s} \end{aligned}$$

Ex 9:  Convert 2 weeks to days:

$$2 \text{ wk} = \boxed{14} \text{ d}$$

Answer:

$$\begin{aligned} 2 \text{ wk} &= 2 \times 7 \text{ d} \\ &= 14 \text{ d} \end{aligned}$$

B.2 CONVERTING UNITS OF TIME FROM SMALLER TO BIGGER

Ex 10:  Convert 120 seconds to minutes:

$$120 \text{ s} = \boxed{2} \text{ min}$$

Answer:

$$\begin{aligned} 120 \text{ s} &= 120 \div 60 \text{ min} \\ &= 2 \text{ min} \end{aligned}$$

Ex 11:  Convert 24 hours to days:

$$24 \text{ h} = \boxed{1} \text{ d}$$

Answer:

$$\begin{aligned} 24 \text{ h} &= 24 \div 24 \text{ d} \\ &= 1 \text{ d} \end{aligned}$$

Ex 12:  Convert 180 minutes to hours:

$$180 \text{ min} = \boxed{3} \text{ h}$$

Answer:

$$\begin{aligned} 180 \text{ min} &= 180 \div 60 \text{ h} \\ &= 3 \text{ h} \end{aligned}$$

Ex 13:  Convert 14 days to weeks:

$$14 \text{ d} = \boxed{2} \text{ wk}$$

Answer:

$$\begin{aligned} 14 \text{ d} &= 14 \div 7 \text{ wk} \\ &= 2 \text{ wk} \end{aligned}$$

B.3 DIVIDING TIME

Ex 14: If you divide an hour into two equal periods, how many minutes is one half hour?

$$\text{One half hour} = \boxed{30} \text{ minutes}$$

Answer:

- An hour has 60 minutes.
- We divide it into two equal periods.
- Splitting 60 by 2 gives: $60 \div 2 = 30$.
- One half hour is 30 minutes.

Ex 15: If you divide an hour into four equal periods, how many minutes is one quarter hour?

$$\text{One quarter hour} = \boxed{15} \text{ minutes}$$

Answer:

- An hour has 60 minutes.
- We divide it into four equal periods.
- Splitting 60 by 4 gives: $60 \div 4 = 15$.
- One quarter hour is 15 minutes.

Ex 16: If you divide a day into two equal periods, how many hours is half of a day?

$$\text{Half of a day} = \boxed{12} \text{ hours}$$

Answer:

- A day has 24 hours.
- We divide it into two equal periods.
- Splitting 24 by 2 gives: $24 \div 2 = 12$.
- Half of a day is 12 hours.

C CONVERTING 1 UNIT INTO 2 UNITS

C.1 CONVERTING 2 UNITS INTO 1 UNIT

Ex 17: A movie lasts 1 hour 45 minutes. How many minutes is that?

$$1 \text{ h } 45 \text{ min} = \boxed{105} \text{ min}$$

Answer:

- One hour is 60 minutes. Add the extra 45 minutes to find the total.
- Calculate:

$$\begin{aligned} 1 \text{ h } 45 \text{ min} &= 1 \times 60 \text{ min} + 45 \text{ min} \\ &= 60 \text{ min} + 45 \text{ min} \\ &= 105 \text{ min} \end{aligned}$$

Ex 18: You hold your breath for 2 minutes 20 seconds. How many seconds is that?

$$2 \text{ min } 20 \text{ s} = \boxed{140} \text{ s}$$

Answer:

- 2 minutes is 120 seconds. Add the extra 20 seconds to find the total.
- Calculate:

$$\begin{aligned} 2 \text{ min } 20 \text{ s} &= 2 \times 60 \text{ s} + 20 \text{ s} \\ &= 120 \text{ s} + 20 \text{ s} \\ &= 140 \text{ s} \end{aligned}$$

Ex 19: Your soccer practice lasts 1 hour 30 minutes. How many minutes is that?

$$1 \text{ h } 30 \text{ min} = \boxed{90} \text{ min}$$

Answer:

- One hour is 60 minutes. Add the extra 30 minutes to find the total.
- Calculate:

$$\begin{aligned} 1 \text{ h } 30 \text{ min} &= 1 \times 60 \text{ min} + 30 \text{ min} \\ &= 60 \text{ min} + 30 \text{ min} \\ &= 90 \text{ min} \end{aligned}$$

Ex 20: A trail running race lasts 1 day 5 hours. How many hours is that?

$$1 \text{ d } 5 \text{ h} = \boxed{29} \text{ h}$$

Answer:

- One day is 24 hours. Add the extra 5 hours to find the total.
- Calculate:

$$\begin{aligned} 1 \text{ d } 5 \text{ h} &= 1 \times 24 \text{ h} + 5 \text{ h} \\ &= 24 \text{ h} + 5 \text{ h} \\ &= 29 \text{ h} \end{aligned}$$

C.2 CONVERTING 1 UNIT INTO 2 UNITS

Ex 21: You read a book for 100 minutes. How many hours and minutes is that?

$$100 \text{ min} = \boxed{1} \text{ h} + \boxed{40} \text{ min}$$

Answer:

- One hour is 60 minutes. Divide 100 by 60 to find how many hours, and the rest is minutes.
- Divide:

$$\begin{array}{r} 1 \\ 60 \overline{)100} \\ \underline{60} \\ 40 \end{array}$$

- You get 1 hour, with 40 minutes left over, so:

$$\begin{aligned} 100 \text{ min} &= (1 \times 60 \text{ min}) + 40 \text{ min} \\ &= 1 \text{ h} + 40 \text{ min} \end{aligned}$$

Ex 22: You run a race for 140 seconds. How many minutes and seconds is that?

$$140 \text{ s} = \boxed{2} \text{ min} + \boxed{20} \text{ s}$$

Answer:

- One minute is 60 seconds. Divide 140 by 60 to find how many minutes, and the rest is seconds.
- Divide:

$$\begin{array}{r} 2 \\ 60 \overline{)140} \\ \underline{120} \\ 20 \end{array}$$

- You get 2 minutes, with 20 seconds left over, so:

$$\begin{aligned} 140 \text{ s} &= (2 \times 60 \text{ s}) + 20 \text{ s} \\ &= 2 \text{ min} + 20 \text{ s} \end{aligned}$$

Ex 23: You study for 150 minutes. How many hours and minutes is that?

$$150 \text{ min} = \boxed{2} \text{ h} + \boxed{30} \text{ min}$$

Answer:

- One hour is 60 minutes. Divide 150 by 60 to find how many hours, and the rest is minutes.
- Divide:

$$\begin{array}{r} 2 \\ 60 \overline{)150} \\ \underline{120} \\ 30 \end{array}$$

- You get 2 hours, with 30 minutes left over, so:

$$150 \text{ min} = (2 \times 60 \text{ min}) + 30 \text{ min} \\ = 2 \text{ h} + 30 \text{ min}$$

Ex 24: You swim for 200 seconds. How many minutes and seconds is that?

$$200 \text{ s} = \boxed{3} \text{ min} + \boxed{20} \text{ s}$$

Answer:

- One minute is 60 seconds. Divide 200 by 60 to find how many minutes, and the rest is seconds.
- Divide:

$$\begin{array}{r} 3 \\ 60 \overline{)200} \\ \underline{180} \\ 20 \end{array}$$

- You get 3 minutes, with 20 seconds left over, so:

$$200 \text{ s} = (3 \times 60 \text{ s}) + 20 \text{ s} \\ = 3 \text{ min} + 20 \text{ s}$$

D 24-HOUR TIME FORMAT

D.1 TELLING TIME THE 24-HOUR WAY

Ex 25: Your favorite show starts at 6:15 PM. What time is it in 24-hour time?

$$\boxed{18}:\boxed{15}$$

Answer:

- Look at PM. Add 12 to the hours: $6 + 12 = 18$.
- Keep the minutes: 15 minutes.
- Write the time: **18:15**.

Ex 26: You wake up at 7:45 AM for school. What time is it in 24-hour time?

$$\boxed{07}:\boxed{45}$$

Answer:

- Look at AM. The hours stay the same: 7 hours.
- Keep the minutes: 45 minutes.
- Write the time: **07:45**.

Ex 27: Your soccer game starts at 4:30 PM. What time is it in 24-hour time?

$$\boxed{16}:\boxed{30}$$

Answer:

- Look at PM. Add 12 to the hours: $4 + 12 = 16$.
- Keep the minutes: 30 minutes.
- Write the time: **16:30**.

Ex 28: You eat dinner at 7:00 PM. What time is it in 24-hour time?

$$\boxed{19}:\boxed{00}$$

Answer:

- Look at PM. Add 12 to the hours: $7 + 12 = 19$.
- Keep the minutes: 0 minutes.
- Write the time: **19:00**.

D.2 FINDING EVERYDAY TIME FROM 24-HOUR CLOCKS

Ex 29: You have breakfast at 07:30. What time is it?

$$\boxed{7}:\boxed{30} \text{ AM}$$

Answer:

- Look at 07:30. It's less than 12:00, so the hours stay 7.
- Keep the minutes: 30 minutes.
- Times before noon are AM.
- Write the time: **7:30 AM**.

Ex 30: Your art class starts at 14:45. What time is it?

$$\boxed{2}:\boxed{45} \text{ PM}$$

Answer:

- Look at 14:45. It's more than 12:00, so subtract 12 from the hours: $14 - 12 = 2$.
- Keep the minutes: 45 minutes.
- Times after 12:00 are PM.
- Write the time: **2:45 PM**.

Ex 31: You go to bed at 20:00. What time is it?

$$\boxed{8}:\boxed{00} \text{ PM}$$

Answer:

- Look at 20:00. It's more than 12:00, so subtract 12 from the hours: $20 - 12 = 8$.
- Keep the minutes: 0 minutes.
- Times after 12:00 are PM.
- Write the time: **8:00 PM**.

Ex 32: Your music lesson starts at 15:20. What time is it?

$$\boxed{3}:\boxed{20} \text{ PM}$$

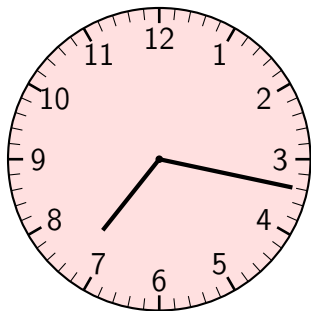
Answer:

- Look at 15:20. It's more than 12:00, so subtract 12 from the hours: $15 - 12 = 3$.
- Keep the minutes: 20 minutes.
- Times after 12:00 are PM.
- Write the time: **3:20 PM**.

E READING CLOCK TIMES

E.1 READING CLOCKS

Ex 33: You leave for school at the time shown on this clock. What time is it?



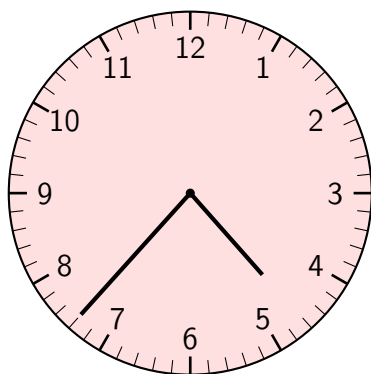
morning

7:17 AM

Answer:

- The little hand is past the 7 but not yet at the 8, so the hour is 7.
- The big hand is between the 3 and 4. The 3 means $3 \times 5 = 15$ minutes. Count 2 more marks after the 3: each mark is 1 minute, so 2 marks add 2 minutes.
- Add: 15 minutes + 2 minutes = 17 minutes.
- It's morning, so the time is **7:17 AM**.

Ex 34: Your soccer practice starts at the time shown on this clock. What time is it?



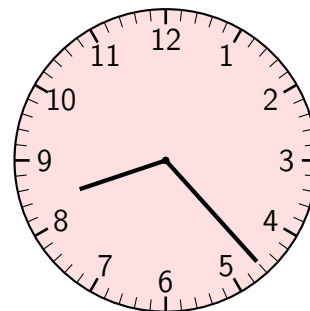
afternoon

4:37 PM

Answer:

- The little hand is past the 4 but not yet at the 5, so the hour is 4.
- The big hand is between the 7 and 8. The 7 means $7 \times 5 = 35$ minutes. Count 2 more marks after the 7: each mark is 1 minute, so 2 marks add 2 minutes.
- Add: 35 minutes + 2 minutes = 37 minutes.
- It's afternoon, so the time is **4:37 PM**.

Ex 35: You eat breakfast at the time shown on this clock. What time is it?



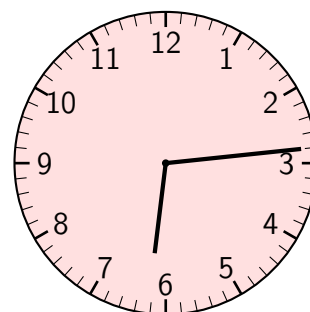
morning

8:23 AM

Answer:

- The little hand is past the 8 but not yet at the 9, so the hour is 8.
- The big hand is between the 4 and 5. The 4 means $4 \times 5 = 20$ minutes. Count 3 more marks after the 4: each mark is 1 minute, so 3 marks add 3 minutes.
- Add: 20 minutes + 3 minutes = 23 minutes.
- It's morning, so the time is **8:23 AM**.

Ex 36: You watch a movie at the time shown on this clock. What time is it?



evening

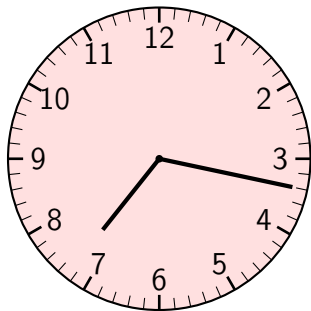
6:14 PM

Answer:

- The little hand is past the 6 but not yet at the 7, so the hour is 6.
- The big hand is between the 2 and 3. The 2 means $2 \times 5 = 10$ minutes. Count 4 more marks after the 2: each mark is 1 minute, so 4 marks add 4 minutes.
- Add: 10 minutes + 4 minutes = 14 minutes.
- It's evening, so the time is **6:14 PM**.

E.2 READING CLOCKS FOR 24-HOUR TIME

Ex 37: You leave for school at the time shown on this clock. What time is it in 24-hour format?



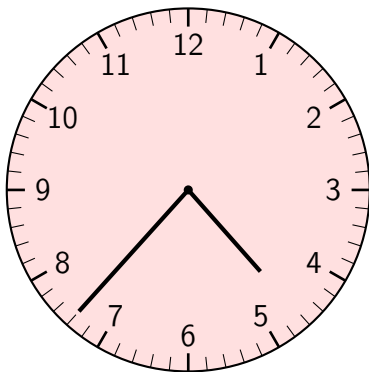
morning

07:17

Answer:

- The little hand is past the 7 but not yet at the 8, so the hour is 7.
- The big hand is between the 3 and 4. The 3 means $3 \times 5 = 15$ minutes. Count 2 more marks after the 3: each mark is 1 minute, so 2 marks add 2 minutes.
- Add: 15 minutes + 2 minutes = 17 minutes.
- It's morning, so the hours stay the same. Add a zero before 7 for 24-hour time. The time is **07:17**.

Ex 38: Your soccer practice starts at the time shown on this clock. What time is it in 24-hour format?



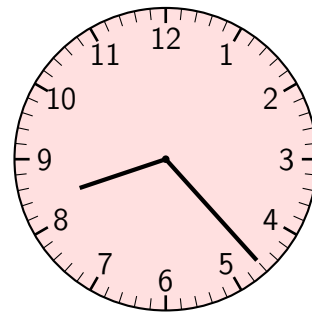
afternoon

16:37

Answer:

- The little hand is past the 4 but not yet at the 5, so the hour is 4.
- The big hand is between the 7 and 8. The 7 means $7 \times 5 = 35$ minutes. Count 2 more marks after the 7: each mark is 1 minute, so 2 marks add 2 minutes.
- Add: 35 minutes + 2 minutes = 37 minutes.
- It's afternoon, so add 12 to the hours: $4 + 12 = 16$. The time is **16:37**.

Ex 39: You eat breakfast at the time shown on this clock. What time is it in 24-hour format?



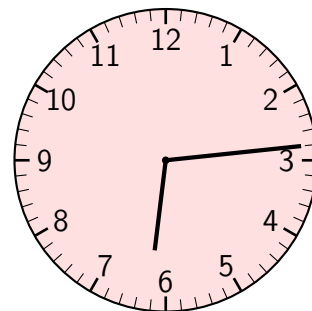
morning

08:23

Answer:

- The little hand is past the 8 but not yet at the 9, so the hour is 8.
- The big hand is between the 4 and 5. The 4 means $4 \times 5 = 20$ minutes. Count 3 more marks after the 4: each mark is 1 minute, so 3 marks add 3 minutes.
- Add: 20 minutes + 3 minutes = 23 minutes.
- It's morning, so the hours stay the same. Add a zero before 8 for 24-hour time. The time is **08:23**.

Ex 40: You watch a movie at the time shown on this clock. What time is it in 24-hour format?



evening

18:14

Answer:

- The little hand is past the 6 but not yet at the 7, so the hour is 6.
- The big hand is between the 2 and 3. The 2 means $2 \times 5 = 10$ minutes. Count 4 more marks after the 2: each mark is 1 minute, so 4 marks add 4 minutes.
- Add: 10 minutes + 4 minutes = 14 minutes.
- It's evening, so add 12 to the hours: $6 + 12 = 18$. The time is **18:14**.

F ADD AND SUBTRACT TIME

F.1 ADDING TIME

Ex 41: You watch a movie for 1 hour 20 minutes and do homework for 1 hour 15 minutes. How long is that altogether?

2 h 35 min

Answer:

- Add the minutes: 20 minutes + 15 minutes = 35 minutes.
- Since 35 minutes is less than 60, no extra hour is needed.
- Add the hours: 1 hour + 1 hour = 2 hours.
- So, you spent 2 hours and 35 minutes altogether.
-

$$\begin{aligned}1 \text{ h } 20 \text{ min} + 1 \text{ h } 15 \text{ min} &= (1 \text{ h} + 1 \text{ h}) + (20 \text{ min} + 15 \text{ min}) \\&= 2 \text{ h} + 35 \text{ min} \\&= 2 \text{ h } 35 \text{ min}\end{aligned}$$

Ex 42: You ride your bike for 1 hour 25 minutes and play soccer for 1 hour 30 minutes. How long is that altogether?

$$\boxed{2} \text{ h } \boxed{55} \text{ min}$$

Answer:

- Add the minutes: 25 minutes + 30 minutes = 55 minutes.
- Since 55 minutes is less than 60, no extra hour is needed.
- Add the hours: 1 hour + 1 hour = 2 hours.
- So, you spent 2 hours and 55 minutes altogether.
-

$$\begin{aligned}1 \text{ h } 25 \text{ min} + 1 \text{ h } 30 \text{ min} &= (1 \text{ h} + 1 \text{ h}) + (25 \text{ min} + 30 \text{ min}) \\&= 2 \text{ h} + 55 \text{ min} \\&= 2 \text{ h } 55 \text{ min}\end{aligned}$$

Ex 43: You spend 1 hour 15 minutes on Math homework and 55 minutes on Science homework. How long is that altogether?

$$\boxed{2} \text{ h } \boxed{10} \text{ min}$$

Answer:

- Add the minutes: 15 minutes + 55 minutes = 70 minutes.
- Too many minutes! 70 minutes is more than 60, so take 60 minutes (1 hour) and keep 10 minutes: 70 min = 1 h 10 min.
- Add the hours: 1 hour + 0 hours + 1 hour (extra hour) = 2 hours.
- So, you spent 2 hours and 10 minutes altogether.
-

$$\begin{aligned}1 \text{ h } 15 \text{ min} + 55 \text{ min} &= 1 \text{ h} + (15 \text{ min} + 55 \text{ min}) \\&= 1 \text{ h} + 70 \text{ min} \\&= 1 \text{ h} + (1 \text{ h} + 10 \text{ min}) \\&= 2 \text{ h } 10 \text{ min}\end{aligned}$$

Ex 44: You play a game for 2 hours 30 minutes and read a book for 1 hour 45 minutes. How long is that altogether?

$$\boxed{4} \text{ h } \boxed{15} \text{ min}$$

Answer:

- Add the minutes: 30 minutes + 45 minutes = 75 minutes.

- Too many minutes! 75 minutes is more than 60, so take 60 minutes (1 hour) and keep 15 minutes: 75 min = 1 h 15 min.
- Add the hours: 2 hours + 1 hour + 1 hour (extra hour) = 4 hours.
- So, you spent 4 hours and 15 minutes altogether.
-

$$\begin{aligned}2 \text{ h } 30 \text{ min} + 1 \text{ h } 45 \text{ min} &= (2 \text{ h} + 1 \text{ h}) + (30 \text{ min} + 45 \text{ min}) \\&= (2 \text{ h} + 1 \text{ h}) + 75 \text{ min} \\&= (2 \text{ h} + 1 \text{ h}) + (1 \text{ h} + 15 \text{ min}) \\&= 4 \text{ h } 15 \text{ min}\end{aligned}$$

F.2 SUBTRACTING TIME

Ex 45: You have 3 hours 40 minutes to finish your chores. You spend 1 hour 25 minutes cleaning your room. How much time is left?

$$\boxed{2} \text{ h } \boxed{15} \text{ min}$$

Answer:

- Subtract the minutes: 40 minutes - 25 minutes = 15 minutes.
- Enough minutes, so no borrowing is needed.
- Subtract the hours: 3 hours - 1 hour = 2 hours.
- So, you have 2 hours and 15 minutes left.
-

$$\begin{aligned}3 \text{ h } 40 \text{ min} - 1 \text{ h } 25 \text{ min} &= (3 \text{ h} - 1 \text{ h}) + (40 \text{ min} - 25 \text{ min}) \\&= 2 \text{ h} + 15 \text{ min} \\&= 2 \text{ h } 15 \text{ min}\end{aligned}$$

Ex 46: You have 2 hours 35 minutes before dinner. You spend 1 hour 20 minutes practicing piano. How much time is left?

$$\boxed{1} \text{ h } \boxed{15} \text{ min}$$

Answer:

- Subtract the minutes: 35 minutes - 20 minutes = 15 minutes.
- Enough minutes, so no borrowing is needed.
- Subtract the hours: 2 hours - 1 hour = 1 hour.
- So, you have 1 hour and 15 minutes left.
-

$$\begin{aligned}2 \text{ h } 35 \text{ min} - 1 \text{ h } 20 \text{ min} &= (2 \text{ h} - 1 \text{ h}) + (35 \text{ min} - 20 \text{ min}) \\&= 1 \text{ h} + 15 \text{ min} \\&= 1 \text{ h } 15 \text{ min}\end{aligned}$$

Ex 47: You have 4 hours 10 minutes to complete your tasks. You spend 2 hours 45 minutes organizing your books. How much time is left?

$$\boxed{1} \text{ h } \boxed{25} \text{ min}$$

Answer:

- Subtract the minutes: 10 minutes - 45 minutes. Not enough minutes! Borrow 1 hour (60 minutes) from the 4 hours, leaving 3 hours. Add 60 minutes to 10 minutes: $10 + 60 = 70$ minutes.
- Now subtract: 70 minutes - 45 minutes = 25 minutes.
- Subtract the hours: 3 hours - 2 hours = 1 hour.
- So, you have 1 hour and 25 minutes left.

$$\begin{aligned} 4 \text{ h } 10 \text{ min} - 2 \text{ h } 45 \text{ min} &= 3 \text{ h } 70 \text{ min} - 2 \text{ h } 45 \text{ min} \\ &= (3 \text{ h} - 2 \text{ h}) + (70 \text{ min} - 45 \text{ min}) \\ &= 1 \text{ h } 25 \text{ min} \end{aligned}$$

Ex 48: You have 3 hours 15 minutes to work on a project. You spend 1 hour 40 minutes writing a story. How much time is left?

$$\boxed{1} \text{ h } \boxed{35} \text{ min}$$

Answer:

- Subtract the minutes: 15 minutes - 40 minutes. Not enough minutes! Borrow 1 hour (60 minutes) from the 3 hours, leaving 2 hours. Add 60 minutes to 15 minutes: $15 + 60 = 75$ minutes.
- Now subtract: 75 minutes - 40 minutes = 35 minutes.
- Subtract the hours: 2 hours - 1 hour = 1 hour.
- So, you have 1 hour and 35 minutes left.

$$\begin{aligned} 3 \text{ h } 15 \text{ min} - 1 \text{ h } 40 \text{ min} &= 2 \text{ h } 75 \text{ min} - 1 \text{ h } 40 \text{ min} \\ &= (2 \text{ h} - 1 \text{ h}) + (75 \text{ min} - 40 \text{ min}) \\ &= 1 \text{ h } 35 \text{ min} \end{aligned}$$

Ex 49: You have 4 hours 15 minutes of free time. You play a game for 1 hour 45 minutes. How much time is left?

$$\boxed{2} \text{ h } \boxed{30} \text{ min}$$

Answer:

- Subtract the minutes: 15 minutes - 45 minutes. Not enough minutes! Borrow 1 hour (60 minutes) from the 4 hours, leaving 3 hours. Add 60 minutes to 15 minutes: $15 + 60 = 75$ minutes.
- Now subtract: 75 minutes - 45 minutes = 30 minutes.
- Subtract the hours: 3 hours - 1 hour = 2 hours.
- So, you have 2 hours and 30 minutes left.

$$\begin{aligned} 4 \text{ h } 15 \text{ min} - 1 \text{ h } 45 \text{ min} &= 3 \text{ h } 75 \text{ min} - 1 \text{ h } 45 \text{ min} \\ &= (3 \text{ h} - 1 \text{ h}) + (75 \text{ min} - 45 \text{ min}) \\ &= 2 \text{ h } 30 \text{ min} \end{aligned}$$

G TIME PROBLEMS

G.1 FIGURING OUT TIME

Ex 50: You work 2 hours 30 minutes on Saturday and 1 hour 20 minutes on Sunday. How much time do you work altogether?

$$\boxed{3} \text{ h } \boxed{50} \text{ min}$$

Answer:

- Add the minutes: 30 minutes + 20 minutes = 50 minutes.
- Add the hours: 2 hours + 1 hour = 3 hours.
- So, you work 3 hours and 50 minutes altogether.

$$\begin{aligned} 2 \text{ h } 30 \text{ min} + 1 \text{ h } 20 \text{ min} &= (2 \text{ h} + 1 \text{ h}) + (30 \text{ min} + 20 \text{ min}) \\ &= 3 \text{ h} + 50 \text{ min} \\ &= 3 \text{ h } 50 \text{ min} \end{aligned}$$

Ex 51: A train starts at 8:20 AM and arrives at 1:30 PM. How long is the train journey?

$$\boxed{5} \text{ h } \boxed{10} \text{ min}$$

Answer:

- Subtract the minutes: 30 minutes - 20 minutes = 10 minutes.
- Subtract the hours: 13 hours - 8 hours = 5 hours.
- So, the train journey takes 5 hours and 10 minutes.

$$\begin{aligned} 13 \text{ h } 30 \text{ min} - 8 \text{ h } 20 \text{ min} &= (13 \text{ h} - 8 \text{ h}) + (30 \text{ min} - 20 \text{ min}) \\ &= 5 \text{ h} + 10 \text{ min} \\ &= 5 \text{ h } 10 \text{ min} \end{aligned}$$

Ex 52: Liam has to wrap 12 gift boxes for a charity event. It takes him 3 minutes to wrap each box. How long will it take to wrap all the gift boxes?

$$\boxed{36} \text{ min}$$

Answer:

- Find the total time: 12 gift boxes, and each takes 3 minutes.
- Multiply: $12 \times 3 = 36$ minutes.
- So, Liam will need 36 minutes to wrap all the gift boxes.

$$12 \times 3 \text{ min} = 36 \text{ min}$$

Ex 53: A teacher has 36 minutes to grade tests. Each test takes 3 minutes to grade. How many tests can the teacher grade?

$$\boxed{12} \text{ tests}$$

Answer:

- Find the number of tests: 36 minutes, and each test takes 3 minutes.
- Divide: $36 \text{ minutes} \div 3 \text{ minutes per test} = 12 \text{ tests}$.
- So, the teacher can grade 12 tests.
-

$$36 \text{ min} \div 3 \text{ min per test} = 12$$

Ex 54: You spend 1 hour 40 minutes mixing cookie dough and 1 hour 25 minutes decorating the cookies. How long do you spend baking altogether?

$$\boxed{3} \text{ h } \boxed{5} \text{ min}$$

Answer:

- Add the minutes: $40 \text{ minutes} + 25 \text{ minutes} = 65 \text{ minutes}$.
- Too many minutes! 65 minutes is more than 60, so take 60 minutes (1 hour) and keep 5 minutes: $65 \text{ min} = 1 \text{ h } 5 \text{ min}$.
- Add the hours: $1 \text{ hour} + 1 \text{ hour} + 1 \text{ hour (extra hour)} = 3 \text{ hours}$.
- So, you spend 3 hours and 5 minutes baking altogether.
-

$$\begin{aligned} 1 \text{ h } 40 \text{ min} + 1 \text{ h } 25 \text{ min} &= (1 \text{ h} + 1 \text{ h}) + (40 \text{ min} + 25 \text{ min}) \\ &= (1 \text{ h} + 1 \text{ h}) + 65 \text{ min} \\ &= (1 \text{ h} + 1 \text{ h}) + (1 \text{ h} + 5 \text{ min}) \\ &= 3 \text{ h } 5 \text{ min} \end{aligned}$$

Ex 55: Sofia needs to bake 15 cupcakes for a school event. Each cupcake takes 5 minutes to prepare. How long will it take to bake all the cupcakes?

$$\boxed{1} \text{ h } \boxed{15} \text{ min}$$

Answer:

- Find the total time: 15 cupcakes, and each takes 5 minutes.
- Multiply: $15 \times 5 = 75 \text{ minutes}$.
- Convert: $75 \text{ minutes} = 60 \text{ minutes} + 15 \text{ minutes} = 1 \text{ h } 15 \text{ min}$.
- So, Sofia will need 1 hour and 15 minutes to bake all the cupcakes.
-

$$\begin{aligned} 15 \times 5 \text{ min} &= 75 \text{ min} \\ &= 60 \text{ min} + 15 \text{ min} \\ &= 1 \text{ h } 15 \text{ min} \end{aligned}$$

Ex 56: To plant the vegetables, it takes me 20 hours, and I work over 4 days. How many hours do I work per day?

$$\boxed{5} \text{ hours per day}$$

Answer:

- Find the hours per day: 20 hours total, spread over 4 days.
- Divide: $20 \text{ hours} \div 4 \text{ days} = 5 \text{ hours per day}$.

- So, I work 5 hours per day.

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$$20 \text{ hours} \div 4 \text{ days} = 5 \text{ hours per day}$$

Ex 57: In a library, I begin to work at 8:30 AM, and I finish at 10:20 AM. How much time do I work?

$$\boxed{1} \text{ h } \boxed{50} \text{ min}$$

Answer:

- Subtract the minutes: 20 minutes - 30 minutes. Not enough minutes! Borrow 1 hour (60 minutes) from the 10 hours, leaving 9 hours. Add 60 minutes to 20 minutes: $20 + 60 = 80 \text{ minutes}$.
- Now subtract: $80 \text{ minutes} - 30 \text{ minutes} = 50 \text{ minutes}$.
- Subtract the hours: $9 \text{ hours} - 8 \text{ hours} = 1 \text{ hour}$.
- So, I work for 1 hour and 50 minutes.
-

$$\begin{aligned} 10 \text{ h } 20 \text{ min} - 8 \text{ h } 30 \text{ min} &= 9 \text{ h } 80 \text{ min} - 8 \text{ h } 30 \text{ min} \\ &= (9 \text{ h} - 8 \text{ h}) + (80 \text{ min} - 30 \text{ min}) \\ &= 1 \text{ h } 50 \text{ min} \end{aligned}$$